U. S. Government

RESEARCH REPORTS

April 11, 1958
Vol. 29, No. 4

ENGINEERING LIBRARY

. . . A monthly listing of Government research reports available to industry . . .

In this issue:

Upper-Atmosphere Research: History of the Upper-Air Rocket Research Program at the Naval Research Laboratory

Project Vanguard: Minitrack Reports 3 and 4

Research to Investigate the Feasibility of Electron Mirror Microscopy in the Study of Magnetic Domains

Bibliography of Fuel Stability

Cold-Cured Piezoelectric Ceramics

Russian-English Glossary: Aeronautical and Miscellaneous Technical Terms

Polymerization Studies on Monomers and Evaluation of Derivative Polymers

Evaluation of the Trainer-Tester and Punchboard Tutor as Electronics Trouble-Shooting Training Aids

Complete list of printed reports begins on page 181

U. S. DEPARTMENT OF COMMERCE

Office of Technical Services

The PB Reports . . .

announced in this publication have just been released, usually by agencies of the U. S. Government, for dissemination to the public. In most instances they result from Government or Government-sponsored research.

The Office of Technical Services is responsible, under Public Law 776, 81st Congress, for the collection and distribution of these technical reports in the interest of American science and industry.

The more important reports are reprinted for sale to the public by OTS. Many of the reports are so specialized that the demand for them does not warrant reproduction of printed copies; originals of these documents are deposited at the Library of Congress. There they may be inspected in the Annex Reading Room, or copies may be ordered from the Library in either photocopy or microfilm.

PB reports of special interest to smaller businesses are abstracted in OTS's monthly *Technical Reports Newsletter*, available from the Superintendent of Documents, Washington 25, D. C., at $1 a year domestic, $1.50 foreign.

Since 1945 thousands of business firms have used PB reports in their research programs. These reports now constitute one of the world's largest collections of non-confidential technical information, numbering over 250,000 items. OTS has published catalogs of related reports in more than 300 areas of industrial interest. For further information relative to any of its activities, you are invited to write OTS, U. S. Department of Commerce, Washington 25, D. C.

Except to the extent indicated by acknowledgment of authorship, OTS does not edit PB reports, nor does it accept responsibility for the information and conclusions contained in them. If copyrighted material appears, permission for its use should be requested from the copyright owners. Any national security restrictions that may have applied to these reports have been removed. Patents may cover the subject matter of any report, and the reader is advised to make patent searches before developing applications based on the reports.

How To Order

ALWAYS USE COMPLETE TITLE AND PB NUMBER of each report ordered. The letter "s" accompanying some PB numbers means "supplement," "t" means "translation," and "r" means a partial or complete revision. These letters should be included as part of the PB number. Prepayment is required.

TO ORDER FROM LC • Address your order to Library of Congress, Photoduplication Service, Publications Board Project, Washington 25, D. C. Make check or money order payable to Chief, Photoduplication Service, Library of Congress. State whether report is desired in microfilm or photocopy. Microfilm copies are in 35 millimeter film and require special reading equipment; if you do not have such a machine you may be able to use one at a library in your area.

TO ORDER FROM OTS • Address your order to Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. Make check or money order payable to OTS, Department of Commerce. Reports available from OTS may also be ordered through Department of Commerce field offices.

TO ORDER FROM OTHER SOURCES • When an agency other than OTS or LC is the source, use the full address included in the abstract of the report. Make check or money order payable to that agency.

U. S. GOVERNMENT RESEARCH REPORTS

OFFICE OF TECHNICAL SERVICES
John C. Green, *Director*

U. S. DEPARTMENT OF COMMERCE
Sinclair Weeks, *Secretary*

Issued monthly. Annual subscription $6 ($3 additional for foreign mailing). Single copy 60 cents. In the U. S. make remittance payable to Superintendent of Documents and mail either to a Department of Commerce field office or to Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Address changes should be sent to Superintendent of Documents. Outside the U. S. make remittance payable to and order from OTS, U. S. Department of Commerce, Washington 25, D. C. Foreign address changes should be sent to OTS.

Contents are not copyrighted and may be reprinted freely. Mention of source will be appreciated.

Use of funds for printing this publication approved by the Director of the Bureau of the Budget, August 22, 1955.

U. S. DEPARTMENT OF COMMERCE

OFFICE OF TECHNICAL SERVICES

U. S. Government RESEARCH REPORTS

Vol. 29, No. 4 April 11, 1958

Contents

	Page
Apparel	183
Bibliography	183
Chemicals and Allied Products	184
Deterioration Studies	190
Electrical Machinery	190
Fuels and Lubricants	195
Highways and Bridges	198
Instruments	198
Machinery	201
Mathematics and Statistical Analysis	201
Medical Research and Practice	203
Metals and Metal Products	204
Meteorology and Climatology	206
Minerals and Mineral Products	209
Ordnance and Accessories	209
Personnel Aptitude Testing	210
Photographic and Optical Goods	210
Physics	211
Physiology	214
Psychology	215
Rubber and Rubber Products	217
Textiles and Textile Products	217
Transportation Equipment	218
Water Supply, Sanitation and Public Health	223
Miscellaneous	223
Atomic Energy Commission Reports	225

Printed Reports Available from OTS Announced in This Issue

	Page
Bacterial electrophoresis studies. (PB 131484) 75 cents	203
Bibliography of fuel stability. (PB 131482) $5.00	183
Chemical reactions of silicon isocyanates. (PB 131621) 50 cents	186
Cold-cured piezoelectric ceramics. (PB 131523) 50 cents	209
Dielectric plate array. (PB 131473) 75 cents	191
Direction-of-knob-turn stereotypes. (PB 131612) 50 cents	215
Effect of various machining processes on the reversed-bending fatigue strength of A-110 AT titanium alloy sheet. (PB 131606) 50 cents	204
Effective thickness of chromium plate on the sensitivity of magnetic particle inspection. (PB 131608) 50 cents	186
Effects of variations in control deadspace and gain on tracking performance. (PB 131607) 50 cents	199

Page

Electronic target simulator for use with operational radar surveillance systems. (PB 131604) $1.00 199

Evaluation of the trainer-tester and punchboard tutor as electronics trouble-shooting training aids. (PB 131391) $1.75 191

Fundamentals in noise source calibrations at microwave frequencies. (PB 131367) 75 cents 191-192

Further evaluation of a modified controllable-beam runway light. (PB 131494) 50 cents 218

Improvements in the vibrating condenser method of measuring contact potential differences. (PB 131530) 50 cents 192

Investigation of some parameters related to midair collisions of aircraft. (PB 131468) 50 cents 218

NEL reliability bibliography. (PB 121838) $2.75 183

NEL reliability bibliography. Supplement 1. (PB 121838s) $3.00 184

Partition of soluble carbon in Ti-6 Al-4 V alloy. (PB 131603) $2.00 205

Phase relationships in magnesium alloys. (PB 131622) $1.00 205

Polymerization studies on monomers and evaluation of derivative polymers. (PB 131594) $3.00 185

Preparation of polymers from halogen-containing olefins and diene monomers. (PB 131615) $2.25 185

Proceedings of the President's conference on technical and distribution research for the benefit of small business, 1957. (131460) $2.50 223

Project Vanguard report no. 23: Minitrack report no. 3: Receiver system. (PB 131390) $1.00 219

Project Vanguard report no. 24: Minitrack report no. 4: Satellite telemetry receiver system. (PB 131396) 50 cents 220

Report of NRL progress, Mar 1958. (PB 131681) $1.25 224

Research on the effects of stress, strain, and temperature on the eutectoid decomposition of titanium alloys. (PB 131610) $2.00 206

Research, problem-solving, and the use of technical information in small and medium sized manufacturing firms. (PB 131578) 75 cents 224

Research to investigate the feasibility of electron mirror microscopy in the study of magnetic domains. (PB 131624) $1.00 193

Review of the development of visual aids for operations in night replenishment at sea. (PB 131421) 50 cents 222

Russian - English glossary, aeronautical and miscellaneous technical terms. (PB 131634) $7.00 224

Silicon-oxygen-tin polymers. (PB 131620) 75 cents 188

Study of a controlled acoustical experiment in a water tank at 213 kc. (PB 131474) 50 cents 223

Study of microdistribution of interstitial elements in titanium by internal friction techniques. (PB 131613) $1.50 190

Summary of specification requirements for military fabrics. (PB 131640) $4.00 217

Page

Terminal system effectiveness as a function of the method used by controllers to obtain altitude information: Study of human engineering aspects of radar air traffic control. (PB 131605) 75 cents 216

Toxic-agent vapor source for the demonstration of chemical warfare detection equipment. (PB 131401) 50 cents..... 190

Traversal of the intermediate state of a superconductor by adiabatic magnetization. (PB 131485) 50 cents..... 194

Upper-atmosphere research report no. XXXII: History of the upper-air rocket-research program at the Naval Research Laboratory, 1946-1957. (PB 131521) $1.50 221

Use of the conoscope for the inspection of hot-stretched aircraft glazing materials. (PB 131174) $1.00 201

Visibility in an empty visual field. (PB 131476) 50 cents 216

APPAREL

Comfort evaluation of a form-fitting high altitude helmet, by Milton Alexander and H.T.E. Hertzberg. U.S. Air Force. Air Research and Development Command. Wright Air Development Center. Aero Medical Laboratory, Wright-Patterson Air Force Base, Dayton, O. Feb 1957. 20p photos, diagr, tables. Order from LC. Mi $2.40, ph $3.30. PB 130320

This report describes comfort tests on an experimental pressure helmet assembly, consisting of an outer rigid shell and an inner compressible, form-fitting liner of polyurethane foam. Seventy-two subjects were used, of whom twenty-one were rated military pilots. A number of testing techniques and fabricational requirements for comfort and acceptability are discussed, and their applicability to most forms of headgear, especially those using compressible liner material, is indicated. Project no. 7214. AD 110548. AF WADC TR 56-404.

BIBLIOGRAPHY

Bibliography of fuel stability, with supplement I, by Raymond L. Cappel. Southwest Research Institute. Ordnance Fuels and Lubricants Laboratory, San Antonio, Tex. 1953 - Apr- 1957. 197p. Order from OTS. $5.00. PB 131482

Consists of patent and literature abstracts appearing in Chemical Abstracts, 1929-1952, compiled to provide background information for current and future studies of fuel stability and for prediction of this property by accelerated laboratory test methods. AD 115271. Includes Supplement I, covering the period 1952-1957, published Apr 1957 (65pp). Contract DA 23-072-ORD-934, T.O. 7.

in chemical Abstracts, 1929-52. Contract DA 23-072-ORD-934, T.O. 7.

Bibliography of perceptual-motor performance under varied display-controlled relationships, by Burton G. Andreas. Rochester. University. Dept. of Psychology, Rochester, N.Y. Jun 1953. 21p. Order from L.C. Mi $2.70, ph $4.80. PB 126371

A bibliography of reports of human engineering studies dealing with perceptual-motor performance under conditions of different display-control relationships is presented. In addition to the reports of the experimental studies in which display-control relationships were varied, one part of the bibliography cites general articles, including bibliographies, on human engineering. It is noted that the experimental reports are to be critically reviewed in a later report. For reports 2 and 3 see PB 124780 and 125938. Contract AF 30(602)-200, Scientific report no. 1.

Bibliography of unclassified research reports. Supplement no. 1, Mar 1954 - Mar 1955. U.S. Office of Naval Research. Psychological Sciences Division. Personnel and Training Branch. 22p. Order from LC. Mi $2.70, ph $4.80. PB 116382s

Reports are classified under the following: Isolation and measurement of basic psychological traits, Selection and classification problems, Billet analysis and billet classification research, Performance criteria, Training and education research. Supplement to PB 116382.

NEL reliability bibliography, compiled by W.E. Jorgensen, I.G. Carlson, and C.G. Gros. U.S. Navy Electronics Laboratory, San Diego, Calif. May 1956. 114p. Order from OTS. $2.75. PB 121838

1. Electronic equipment - Reliability - Bibliography

Supplement 1. 1957. 163p. Order from OTS. $3.00. PB 121838s

Reports, technical publications, papers and theses from Apr 1955 - Mar 1956. Texas. University. Electrical Engineering Laboratory, Austin, Tex. Mar 1956. 6p. Order from LC. Mi $1.80, ph $1.80. PB 120412s

Supplement to report no. 75 (PB 120412). 1. Radio waves - Bibliography 2. Engineering, Electrical - Research - Bibliography 3. Contract Nonr-375 (01), NR 371-032 4. TU EERL 75 Suppl. 5. TU EERL M 14

Selected bibliography on water pollution caused by the pulp and paper industry, by Muriel E. Whalley. National Research Council of Canada. Technical Information Service, Ottawa, Can. Feb 1956. 40p. Order from LC. Mi $3.00, ph $6.30. PB 126145

1. Water - Pollution - Bibliography - Canada
2. NRCC TIS 48

CHEMICALS AND ALLIED PRODUCTS

Organic Chemicals

Addition of some fluoropropanes to olefins and the synthesis of fluoroisoprenes, by Paul Tarrant and Raymond P. Lutz. Florida. University, Gainesville, Fla. n.d. 26p tables. Order from LC. Mi $2.70, ph $4.80. PB 126036

Date is 1955 or later. 1. Olefins - Additives 2. Butadiene compounds - Fluorination 3. Fluorine compounds - Organic - Synthesis 4. Contract Nonr-1017(00)

Behavior of organic nitro compounds in liquid scintillation counting systems, by Cecil White and Samuel Helf. U.S. Picatinny Arsenal. Samuel Feltman Ammunition Laboratories, Dover, N.J. May 1956. 16p graphs, tables. Order from LC. Mi $2.40, ph $3.30. PB 126444

A study was made of the feasibility of using liquid scintillation techniques for the radioassay of C^{14}-labelled organic nitro compounds. The results indicate that small quantities of radioactive nitro compounds, sufficient for tracer or analytical application, can be counted in liquid phosphor systems with relatively high efficiencies. The advantages of this technique for the radioassay of explosive and/or volatile materials make it far superior to any other counting method. A general theoretical treatment of the liquid scintillation process is included. Factors influencing counting rates, such as the phenomena of light absorption and the action of wavelength shifters, are discussed. Ordnance project: TB2-0111, Item B. Dept. of the Army project 559-04-001. PA TR 2316.

Final summary report of Office of Naval Research, Dept. of the Navy fellowship no. 1 & Ext. from May 1 through Oct 1955, under Contract Nonr-044 (02), (NR 032-401), by W.J. Kirkpatrick. Mellon Institute of Industrial Research, Pittsburgh, Pa. Oct 1955. 34p table. Order from LC. Mi $3.00, ph $6.30. PB 124832

The object of this investigation was to discover the monomer which could be polymerized to diamond and to find methods of carrying out this polymerization. The original plan called for a long-range research program starting with more readily possibl monomers and operating under gradually more drastic conditions, instead of aiming at quick resul and finding practical operating conditions later. Mellon Institute Fellowship 350, Serial 3137. For Summary report (through July 1955) see PB 121058.

Research investigations of metallo-organic compounds. Final report, 15 Dec 1954-15 Dec 195 by Stanley B. Elliott, Meyer L. Freedman, Robert H. Akiyama and Wilda F. Jackson. Ferr Chemical Corporation, Bedford, O. n.d. 44p tables. Order from LC. Mi $3.30, ph $7.80. PB 128178

A theoretical study of metallo-organic compounds as components of optical plastics was followed by experimental evaluation. Clear, glossy poly (lead cinnamate) was prepared with a refractive index of 1.72. The extreme brittleness of these salt polymers could be modified by plasticization, but the high refractive index was then lost. A series of polyesters and polyamides of benzophenone derivatives were synthesized. These new polymers, with refractive indices in the 1.70 range, offer the possibility of good mechanical properties without plasticization. A new approach to the fabrication of improved rear projection screens was developed. Signal Corps project no. 55-ELS/R-3102. Contract DA 36-039-sc-64576, Final report.

Simple molecular orbital treatment of conjugation in chlorobenzene, by John A. Howe and J.H. Goldstein. Emory University. Chemistry Dept., Emory University, Ga. Mar 1956. 12p diagr, tables. Order from LC. Mi $2.40, ph $3.30. PB 125543

Simple molecular orbital theory, with inclusion of overlap, has been used to calculate the electron distribution and energy levels in chlorobenzene. Resonance dipole moments were also calculated for chlorobenzene and vinyl chloride. The results are

in reasonable agreement with the observed dipole moment decreases and ionization potential shifts, assuming these to be chiefly brought about by conjugation. Dept. of the Army project: 5B99-01-004. ORD project: TB2-0001. OOR project: 551. Contract DA-01-009-ord-440.

Some thermodynamic properties of the nitroparaffins, by Clark L. Dorsey, Louis H. Going and Dysart E. Holcomb. Purdue University. Purdue Research Foundation, Lafayette, Ind. Nov 1948. 44p drawings, graphs, tables. Order from LC. Mi $3.30, ph $7.80. PB 126285

Heats of combustion and latent heats of vaporization of several straight-chain nitroparaffins have been determined experimentally. The resulting values have been used to test the accuracy of three generalized methods of predicting heats of combustion of organic compounds from a knowledge of the chemical structure of the molecules. All three methods gave values accurate to within about one percent. An equation has been developed which correlates the heats of combustion of all of the nitroparaffin samples for which data are available, both from this study and in the open literature, with an average deviation of about two percent. Conclusions reached by other investigations that the heats of explosive powers of pure chemical compounds are related to the oxygen balance of the molecules have been verified and extended. Project Squid. Contract N6ori 104, T.O. 1, NR 220-042. PU TM-5.

Plastics and Plasticizers

Investigation of the nature of the forces of adhesion. Fifth annual report for the period Jul 23, 1953 - Jun 30, 1954 under Contract N9 onr-86701, by L. Reed Brantley, Barbara Stott and John Charnell. Occidental College. Dept. of Chemistry, Los Angeles, Calif. Aug 1954. 35p tables. Order from LC. Mi $3.00, ph $6.30. PB 124872

An introductory investigation of the adsorption of lacquer ingredients on aluminum oxide, which forms the barrier layer on aluminum surfaces, was undertaken in order to determine the chemical composition of the interface between the substrate and the coating, at least prior to the gelation of the coating. Finely divided aluminum oxide adsorbent was shaken in contact with a solution of one or more typical ingredients of lacquers. Adsorption was determined by comparison of the analysis of the solutions before and after exposure to the adsorbent. The individual adsorption of a number of absorbates on aluminum oxide was measured, including a range of concentration in the case of ethylcellulose. For earlier reports see PB 117420 and 121555.

Mechanical behavior of polyacrylonitrile fibers in the presence of an external plasticizer (water), by Cecil E. Reese, Arthur L. Ruoff and Henry Eyring. Utah. University. Institute for the Study of Rate Processes, Salt Lake City, Utah. Apr 1955. 12p graphs, tables. Order from LC. Mi $2.40, ph $3.30. PB 126149

The three-element hyperbolic sine model is discussed in detail. The conditions for which this model could be expected to hold are discussed. It has been shown that the above model is applicable to the mechanical properties of polyacrylonitrile fibers at various relative humidities. The variations of the model parameters with relative humidity are plotted and the significant changes are discussed. Contract N7 onr 45101, NR 032-168. UU ISRP TR 49.

Methods for testing the strength properties of adhesives and test data, by H.E. Mathews, Jr. and I. Silver. U.S. Naval Ordnance Laboratory, White Oak, Md. Mar 1956. 82p photos, drawings, tables. Order from LC. Mi $4.80, ph $13.80. PB 126956

This report is presented in two parts. Part I consists of a description of a number of test procedures developed at the Naval Ordnance Laboratory for evaluating the strength properties of adhesives used for the bonding of metals and plastics and their combinations. Part II consists of data obtained employing these test methods. NAVORD 3923.

Polymerization studies on monomers and evaluation of derivative polymers, by Faber B. Jones, Cherie A. Lichtenwalter, Palmer B. Stickney and Randall G. Heiligmann. Battelle Memorial Institute, Columbus, O. Oct 1957. 170p photos, drawings, diagrs, graphs (part fold), tables. Order from OTS. $3.00. PB 131594

This report describes research to determine the polymerization characteristics of a group of experimental fluorine-containing monomers and a preliminary evaluation of the potential of the resulting polymeric products as high-temperature and solvent-resistant rubbers and plastics. The homopolymerization of a group of six fluorinated olefin oxides in mass and solution using numerous different polymerization catalysts yielded only low-molecular-weight liquid polymeric products. Copolymerization of several fluorine-containing propenyl ketones with dienes yielded some promising elastomers. Copolymerization of some fluorinated pentadienes, butenes and pentenes was effected to yield resinous solids; homopolymerization of these monomers was unsuccessful. Some fluorine-containing cyclic olefins were homopolymerized and copolymerized. AD 142050. Project no. 7340. Covers period 1 Mar 1956 to 31 Jan 1957 under Contract AF 33(616)-3313. AF WADC TR 57-110.

Preparation of polymers from halogen-containing olefins and diene monomers, by H. Iserson, M. Hauptschein and F.E. Lawlor. Pennsalt Chemical Corporation, Philadelphia, Pa. Nov 1957. 92p tables. Order from OTS. $2.25. PB 131615

Synthetic work on this project included the preparation of fluoro- and fluorohalo- olefins and dienes. Among the monomers prepared were 3-chloro-1, 1, 2-trifluorobutadiene, 1, 2-dichloro-3, 4, 4-trifluorobutadiene, 1, 1, 2-trichloro-3, 4, 4-trifluorobutadiene, 3-bromo-1, 1, 2- trifluorobutadiene, 1, 1, 2, 3-tetrafluorobutadiene, 1, 4-dichlorotetrafluorobutadiene, 1, 1-difluoroisobutylene, 1-trifluorovinyl-2-chloro-2, 3, 3-trifluorocyclobutane, 1-vinyl-2-chloro-1, 2, 3, 3, 4, 4-hexafluorocyclobutane, perfluoro-1-vinylcyclobutene-1. Polymerizations have been tried with these and other olefins. AD 142116. Project 7340. Covers period July 1955 to Jan 1957 under Contract AF 33(616)-3137. AF WADC TR 57-436.

Some optical studies of the structure of high polymers, by R.S. Stein, including technical report no. 4: Optical properties of oriented polyethylene films, by F.H. Norris and R.S. Stein. Massachusetts. University. Dept. of Chemistry, Amherst, Mass. Aug 1956. 265p photos, diagrs, graphs, tables. Order from LC. Mi $11.10, ph $41.40. PB 128952

This summarizes accomplishments in studies of the crystallization and orientation of polyethylene films using the techniques of light scattering, birefringence, x-ray diffraction, and infra-red dichroism. Contract Nonr 702(00), NR 330-024, Final report. Continued under Contract Nonr 215100, NR 356-378.

Technical report for period 1 Aug 1954 - 1 Oct 1955, under Contract Nonr 1349(01), by M. Szwarc. New York State College of Forestry, Syracuse University, Syracuse, N.Y. 1955. 49p graphs, tables. Order from LC. Mi $3.30, ph $7.80. PB 128364

This report is divided into three parts, as follows: 1. A reprint of a paper published in the Journal of Polymer Science vol. 18, no. 90, Dec 1955: "The rate of termination in polymerizations initiated by benzoyl peroxide and ammonium persulphate, " by I. Jarkovsky, V. Stannett, and M. Szwarc. 2. A copy of a paper accepted for publication by the Journal of the American Chemical Society, tentatively scheduled to appear in the February or March 1956, issue: "The Instantaneous polymerization of styrene by trifluoroacetic acid, "by J.J. Throssell, S.P. Sood, M. Szwarc, and V. Stannett. 3. Progress report concerning a summary of some exploratory work. The following systems were investigated: 1. Reactions involving S_2 molecules (to study the chemical behavior of some less common active species produced during pyrolysis, with particular emphasis on their role in initiating polymerization). 2. Reactions involving P_2 molecules (results not encouraging). 3. Reaction between CO and Si (experiments not successful). 4. Reactions involving SO molecules. 5. Systems which may lead to the formation of poly-salts.

Paints, Varnishes and Lacquers

Development of improved heater wire coating methods and materials. First quarterly report, May 1, 1956 to May 31, 1956, under Contract AF 19(604)-1744, by Charlotte Curtis and David Bergeron. Columbia Broadcasting System, Inc. CBS-HYTRON Division, Danvers, Mass. 1956. 25p drawing, diagr, tables. Order from LC. Mi $2.70, ph $4.80. PB 126151

The objective of this program is the development of improved techniques and materials for coating cathode heater wires. Report includes a patent review experimental data on alundum coating, the heater-cathode leakage problem, lacquering of wire, and formulations for heater coatings and lacquers. AF CRC TN 56-392.

Effective thickness of chromium plate on the sensitivity of magnetic particle inspection, by W. Steindorf and B. Cohen. U.S. Air Force. Air Research and Development Command. Wright Air Development Center. Materials Laboratory Wright-Patterson Air Force Base, Dayton, O. Oct 1957. 13p drawings, table. Order from OTS. 50 cents. PB 131608

A survey was conducted on small cracked rods to determine the size crack which can be detected by magnetic particle inspection. Chromium plating 2.2, 4.4, and 6.6 mils thick were successively plated to these rods and the rods were examined after each plating. Scotch tape transfers were taken and studied in conjuction with the subsequently measured cracks. The summation of results indicate that 4.5 mils is a practical limitation of the effective depth of chromium plate for magnetic particle inspection of the plated body. AD 142080. Project no. 7360. AF WADC TR 57-342.

Inorganic Chemicals

Chemical reactions of silicon isocyanates, by Joseph F. O'Brien. U.S. Air Force. Air Research and Development Command. Wright Air Development Center. Materials Laboratory, Wright-Patterson Air Force Base, Dayton, O. Oct 1957. 17p tables. Order from OTS. 50 cents. PB 131621

The purpose of this research was to examine the chemical properties of silicon isocyanates to see if these isocyanates can be used as monomers for the preparation of silicon-containing polyurethane resins. A prototype silicon isocyanate, trimethylsilylisocyanate, was reacted with amines, Grignard reagents, alcohols and glycols. It was found that amines, Grignard reagents and alcohols cleave the isocyanate group from the silicon atom to form the corresponding alkyl urea, alkyl amide and alkyl biuret respectively. The glycols do not cleave the

isocyanate group from the silicon, but add to trimethylsilylisocyanate to form the corresponding bis (trimethylsilyl) carbamate. AD 142101. Project 7340. Covers period May 1954 - Aug 1956. AF WADC TR 57-503.

Crystallographic and magnetochemical studies on ABO_3 group compounds of lanthanon and manganese oxides, by Ardys Klann and R.C. Vickery. Horizons Inc. Chemistry Dept., Cleveland, O. Mar 1957. 8p table. Order from LC. Mi $1.80, ph $1.80. PB 126628

AD 120477. 1. Earths, Rare - Compounds - Crystal structure 2. Earths, Rare - Compounds - Magnetochemical properties 3. Manganese compounds - Magnetochemical properties 4. Contract AF 18(603)-96, Technical note no. 1 5. AF OSR TN 57-122

Effect of low temperature plastic deformation upon the optical properties of alkali halides, by G. Chiarotti. Illinois. University, Urbana, Ill. Apr 1957. 32p diagrs, graphs. Order from LC. Mi $3.00, ph $6.30. PB 126042

The optical absorption spectrum of KBr and KI crystals, which have been plastically deformed at low temperature, has been observed in the region of the δ band in order to detect single ion vacancies generated by moving dislocations. A general broadening of the fundamental absorption band takes place after plastic deformation. On the other hand a yellow photoluminescence can be excited in the spectral region of the broadened fundamental absorption. A rough proportionality exists between the amount of luminescence and the number of photons absorbed in the region of the crystal responsible for the extra-absorption. Annealing at room temperature reduces both luminescence and extra-absorption. A qualitative explanation is given, which is based on the present knowledge of defects in alkali halides. AD 126447. Contract AF 18(600)-962. AF OSR TN 57-155.

Enteisenung von aluminiumsulfatlösungen durch behandlung mit titansäurehydrat. (Purification of aluminum sulphate solution by treatment with titanic acid hydroxide), by F. Keysser. Oct 1941. 14p. Order from LC. Mi $2.40, ph $3.30. PB 126173

Will not reproduce well. 1. Aluminum sulphate solutions - Purification - Germany 2. Titanic acid hydroxides - Effect on aluminum sulphates - Germany 3. BIOS HEC 12259 4. Micro BIOS FD 257/48

Flammability limits of diborane, by D.K. Eads and C.A. Thomas. Callery Chemical Company, Callery, Pa. Dec 1955. 10p graphs. Order from LC. Mi $1.80, ph $1.80. PB 130195

The flammability limits of diborane in dry carbon dioxide-free air were measured in a vertical glass tube which had an I.D. of five cm. Concentrations from 0.9 to 98 mole percent diborane were flammable and a lower pressure limit was found at about three mm. absolute and 15 mole percent diborane. AD 109279. CCC-1024-TR-163.

Fundamental studies of the lead-oxygen system. Second annual summary report, 1 Aug 1955 to 31 Jul 1956, under Contract Nonr-1513(00), by P.E. Jensen and E.J. Ritchie. Eagle-Picher Research Laboratories, Joplin, Mo. Sep 1956. 64p photos, drawings, tables. Order from LC. Mi $3.90, ph $10.80. PB 128537

This report covers the work which has been done in the effort to explain why an increase in temperature from 25°C. to 475°C. will cause some of the X-ray diffraction lines of high purity yellow litharge to shift anomalously. The evidence obtained from a number of diffraction studies is not yet conclusive since complete powder patterns suitable for precise measuring have not been obtained at 475°C. See PB 123135 for 1st annual report.

Further study of the kinetics of thermal decomposition of aluminum borohydride, by Richard S. Brokaw. Princeton University. Dept. of Chemistry, Princeton, N.J. Mar 1949. 10p graphs. Order from LC. Mi $1.80, ph $1.80. PB 126281

The decomposition of aluminum borohydride has been studied at 159°C and 189°C and the disappearance of aluminum borohydride with time has been followed. The effect of various surfaces on the decomposition rate has been shown to be slight at 159°C. A possible mechanism for the decomposition is proposed. Technical paper no. 44. Under joint sponsorship of Projects Bumblebee (Nord 7920, Task PRN3) and Squid. Contract N6-ori-105, T.O. III, Phase 2, NR 220-038. Contract Nord 7920. PU TM-12.

Investigation into the growth of small aerosol particles with humidity change, by Clyde Orr, Jr., F. Kenneth Hurd, Warren P. Hendrix and William J. Corbett, III. Georgia Institute of Technology. State Engineering Experiment Station, Atlanta, Ga. Dec 1956. 89p photo, drawing, graphs, tables. Order from LC. Mi $4.80, ph $13.80. PB 126441

The purpose of this investigation was (1) to obtain quantitative information near room temperature on the pickup and loss of water by nuclei having radii between 0.01 and 0.1 μ as relative humidity changed, and (2) to determine if the results could have been predicted from physical data. Sodium chloride, ammonium sulfate, calcium chloride, silver iodide, lead iodide, and potassium chloride were employed as the nuclei materials. Project A-162, Final report. Contract AF 19(604)-1086.

Kinetics of the reaction of aluminum borohydride vapor with olefins, by Richard S. Brokaw. Princeton University. Dept. of Chemistry, Princeton, N.J. Dec 1948. 16p drawings, graphs, tables. Order from LC. Mi $2.40, ph $3.30. PB 126280

The reactions between aluminum borohydride vapor ($Al(BH_4)_3$), and ethylene, C_2H_4, propylene, C_3H_6, and butene-1, C_4H_6, have been studied, and the kinetics have been found to be first order with respect to the aluminum borohydride pressure and independent of the olefin concentration. The activation energy has been determined and a reaction mechanism is proposed. All three reactions occur at nearly the same rate. Boron alkyls are products of the reactions. The reactions are of interest in their bearing on the oxidation of the hydrocarbons induced by borohydride vapor. Technical paper no. 42. Under joint sponsorship of Projects Bumblebee (Nord 7920, PRN-3) and Squid. Contract N6-ori-105, T.O. III, Phase 2, NR 220-038. Contract Nord 7020. PU TM-9.

Palladium studies in neutron activation of alkali palladium chlorides, by Alfred J. Moses. U.S. Arsenal, Watertown, Mass. Dec 1955. 17p photo, graphs, table. Order from LC. Mi $2.40, ph $3.30. PB 126040

The report investigates the states of chemical combinations of palladium resulting from neutron bombardment of the hexachloropalladium (II) and hexachloropalladium (IV) ions. It discusses methods of preparation, spectrographic analysis, and solubility studies of potassium and rubidium hexachloropalladium (IV), K_2PdCl_6 and Rb_2PdCl_6, and of potassium and rubidium tetrachloropalladium (II), K_2PdCl_4 and Rb_2PdCl_4. The yield of radioactive palladium-109 was studied. O.O. project no. TB2-001. Dept. of the Army project no. 599-01-004. WAL R 804/16.

Precise studies of the crystal structure of lithium perchlorate trihydrate, anhydrous lithium perchlorate and potassium perchlorate, by Richard J. Prosen and Kenneth N. Trueblood. California. University. Dept. of Chemistry, Los Angeles, Calif. Nov 1956. 85p diagrs, graph, tables. Order from LC. Mi $4.80, ph $13.80. PB 126442

The purpose of this work has been to determine the precise geometry of the perchlorate ion. Three crystal structures ($LiClO_4 \cdot 3H_2O$, $LiClO_4$, and $KClO_4$) have been refined and precise position parameters have been for each. Although the question of bond order in the perchlorate ion has not been answered by this work, the final observed and difference electron density summations for anhydrous lithium perchlorate, studied with higher resolution, revealed electron density maxima within the Cl-O bonds. AD 110384. Contract AF 18(600)-857. AF OSR TN 56-563.

Preliminary study of the photolysis of pentaborane vapor, by Herman Burwasser and Robert N. Pease. Princeton. University. Frick Chemical Laboratory, Princeton, N.J. Jun 1956. 7p table. Order from LC. Mi $1.80, ph $1.80. PB 127945

A preliminary investigation was made of the results of exposing pentaborane vapor to a hydrogen arc through a thin silica window. Equipment is described and results are summarized. Submitted to Journal of Physical Chemistry for publication in 1956. Project Squid. Contract N6 ori-105, Task Order III, NR 098-038. PU TR - 66-P

Preparation of germane, by T.S. Piper and M. Ker Wilson. Harvard University. Mallinckrodt Chemical Laboratory, Cambridge, Mass. Sep 1956. 5p photos, drawings, diagrs, graphs, tables. Order from LC. Mi $1.80, ph $1.80. PB 126446

AD 96508. Chem 30-13. 1. Germanium hydrides Preparation 2. Contract AF 18(600)-590 3. AF OSR TN 56-426

Progress report for the period Aug 18 to Oct 23, 1948, under Contract NOa(s)-9901, by Albert E. Finholt. Metal Hydrides, Inc. Chemical Research Laboratory, Beverly, Mass. Oct 1948. 6p. Order from LC. Mi $1.80, ph $1.80. PB 129241

A discussion of three possible methods for the preparation of aluminum borohydride.

Reaction between atomic hydrogen and molecular oxygen at low pressures. Parts I, II and III, by Elmer J. Badin. Princeton University. Dept. of Chemistry, Princeton, N.J. Jun 1948. 35p diagrs, graphs, tables. Order from LC. Mi $3.00, ph $6.30. PB 126277

Atomic hydrogen from a Wood's hydrogen discharge tube has been reacted with molecular oxygen at low temperatures and pressures. With an excess of hydrogen at liquid nitrogen temperature a good yield of hydrogen perioxide was obtained, but at "dry ice" temperature the yield is zero. It is concluded that at the low pressures involved (about 0.1 mms.) the reaction takes place largely on the surface. Technical paper no. 31. Under joint sponsorship of Projects Bumblebee (Nord 7920, Task PRN-3 and Squid. Contract N6 ori-105, T.O. III, Phase 2 Contract Nord 7920, Task PRN-3. PR TM-5-M-P.

Silicon-oxygen-tin polymers, by Joseph F. O'Brien. U.S. Air Force. Air Research and Development Command. Wright Air Development Center. Materials Laboratory, Wright-Patterson Air Force Base, Dayton, O. Oct 1957. 21p tables. Order from OTS. 75 cents. PB 131620

The purpose of this work was to develop a method for preparing new types of polymeric materials having a silicon-oxygen-tin-oxygen-backbone. It was found that polymers of this structure could be prepared by (1) the reaction of dialkyltin diacetates with dialkyl-diethoxysilanes, and (2) the reaction of dialkyltin dialkoxides with dialkyldiacetoxysilanes. AD 142100. Project no. 7340. Covers work done from Sep 1955 to Feb 1957. AF WADC TR 57-502.

Study of the condensation of nitrogen below the triple point, by Raymond L. Chaun. University of Southern California. Engineering Center, Los Angeles, Calif. Feb 1957. 15p drawing, graphs. Order from LC. Mi $2.40, ph $3.30. PB 126964

An analysis is made of the rate of deposition of solid nitrogen on a cooling surface, in order to obtain design criteria for the condensing chamber of the two-phase wind-tunnel. It is found that the solution of the integral equation characterizing the process is possible through the use of experimental data obtained from a study made at the A. D. Little Laboratory. AD 115052. Contract AF 18(603)-95. USC EC 56-201. AF OSR TN 57-19.

Theory of hydrogen line broadening in high-temperature partially ionized gases, by Alan C. Kolb and Otto Laporte. Michigan. University. Engineering Research Institute, Ann Arbor, Mich. Mar 1957. 154p graphs, tables. Order from LC. Mi $7.50, ph $24.30. PB 126951

The purpose of this investigation is to study theoretically the broadening of the hydrogen Balmer lines observed in the radiation of high-temperature partially ionized gases. The theory is based on the classical path approximation for the motion of the perturbers. The general problem of the broadening of a group of lines arising from transitions between "nearly degenerate" states is considered. The formalism is subsequently specialized to the case where the broadening due to the interactions between an ensemble of ions and a hydrogen atom can be treated as a static perturbation. The validity of this approximation is discussed in detail. The broadening of the Lyman alpha line by electron collisions is considered in detail for comparison with other theories. For this line, the nonadiabatic and the adiabatic effects are found to contribute in the ratio one to two to the broadening. AD 115040. Thesis - University of Michigan. Contract AF 18 (600)-983. MU ERI Proj 2189 - 3 - T. AF OSR TN 57-8.

Thermodynamic properties of the gaseous carbon monoxide, by Jack Belzer, Lydia G. Savedoff and Herrick L. Johnston. Ohio State University. Dept. of Chemistry. Cryogenic Laboratory, Columbus, O. May 1953. 12p tables. Order from LC. Mi $2.40, ph $3.30. PB 126959

The thermodynamic functions of $C^{12}O^{16}$ have been calculated by the punch card method, using the latest values of the fundamental physical constants and the most recent spectroscopic data available. The calculations cover the temperature range from 0^{o} to 6000^{o}K. AD 11325. Contract N6 onr-225, T.O. 12, NR 058-005, Technical report no. 6. OSURF Proj 316. OSURF TR 316-6.

Analytical Chemistry

I. Mass spectometric determination of the atomic and molecular ion concentration in nitrogen glow discharges, by H. Dreeskamp. - II. Determination of atom concentrations in glow discharges through nitrogen and nitrogen-rare gas mixtures, by P. Warneck. - III. Photochemical methane decomposition, by J. Bernard. Bonn. University. Institute of Physical Chemistry, Bonn, Germany. Jul 1954 - Jun 1956. 66p photo, drawings, diagrs, graphs, tables. Order from LC. Mi $3.90, ph $10.80. PB 126627

AD 98741. Technical report covering period Jul 1954 - Jun 1956, under Contract AF 61(514)-731-c, by Wilhelm E. Groth. 1. Atomic power - Research - Germany 2. Methane - Thermal decomposition - Germany 3. Mass spectrometers - Ion sources - Germany 4. Contract AF 61(514)-731-c 5. AF CRC TR 56-291

Polarographic study of azo compounds and azo metal complexes. Final report under Contract AF 18 (600)-496 for period 15 Dec 1952- 31 Aug 1956, by Barbara Cooney, Ray Kirby and W.J. Reid. Duke University. Dept. of Chemistry, Durham, N.C. Sep 1956. 87p graphs, tables. Order from LC. Mi $4.80, ph $13.80. PB 124778

AD 110337. Contents: A polarographic study of 2, 4, 2' - trihydroxyazobenzene - 5' - sulfonic acid, sodium salt, and its complexes with gallium and indium, by W.J. Reid, Jr. and Barbara Cooney. - A spectral study of the aluminum-superchrome garnet Y system, by Ray Kirby. - A spectral and polarographic study of the complexes of aluminum and gallium with o, o' - dihydroxyazobenzene, by Ronald Milburn. Contract AF 18(600)-496, Final report no. 14. AF OSR TR 56-53.

Stanford fluorescent-particle tracer technique; an operational manual, by P.A. Leighton. Stanford University. Dept. of Chemistry, Stanford, Calif. Jun 1955. 159p photos, diagrs, graphs, tables. Order from LC. Mi $7.50, ph $24.30. PB 126400

The fluorescent-particle tracer technique is described in sufficent detail so that it may be used effectively by any group properly equipped. A general discussion appears in the body of the report with references to appendices which give detailed directions in the form of an operational manual. The equipment referred to in these appendices is that which

has been in use during recent field trials. Contract DA 18-064-cml-2564.

Study of microdistribution of interstitial elements in titanium by internal friction techniques, by Devendra Gupta and Sheldon Weinig. New York University. College of Engineering. Research Division, New York, N.Y. Nov 1957. 52p graphs, tables. Order from OTS. $1.50. PB 131613

An investigation of the microdistribution of interstitial elements in Ti and Ti binary alloys and its effect on the mechanical properties was initiated. The experimental techniques which were utilized during this period were internal friction measurements and "hard" tensile testing. The overall study can be separated into three sections, i.e. room temperature effects, interstitial stress relaxation, and grain boundary effects. AD 142145. Project no. 7351, Task 73510. Covers period 1 Mar 1956 to 28 Feb 1957 under Contract AF 33(616)-3393. AF WADC TR 57-420.

Toxic-agent vapor source for the demonstration of chemical warfare detection equipment, by W.S. Brown. U.S. Naval Research Laboratory. Dec 1957. 8p photos, drawing, tables. Order from OTS. 50 cents. PB 131401

To provide for the testing or demonstration of chemical warfare detection devices in the absence of laboratory facilities, a safe, rugged, and controllable source of the vapor of genuine CW agents has been built. There is provision for four different combinations of agent and vapor concentration. The useful life for demonstration purposes between rechargings is about 2-1/2 months for HD and for GB. NRL R 5061.

Miscellaneous Chemicals

Relaxation-time model for free radical concentration, by J. Calvin Giddings. Wisconsin. University, Madison, Wis. Aug 1956. 20p. Order from LC. Mi $2.40, ph $3.30. PB 127947

A relaxation-time model has been used to formulate equations giving an estimate of the departure from the quasi-equilibrium conditions. The equations yield a value for the radical's mole fraction under quite general conditions, but two special cases appear. In the time-lag case, one assumes that the radicals do not diffuse away from the surrounding volume element, but the mixture in the volume element is going through both a temperature and a composition change. The diffusion case applies when a volume element is undergoing no change, but radicals are diffusing from one to another element. Project Squid, Technical report WIS-4-P. To be presented at 6th International Combustion Symposium at Yale University, Aug 19 - 25, 1956. Contract N6 ori-105, T.O. III, NR 098-038.

DETERIORATION STUDIES

Humidity aspects of climatic extremes for combat items, by Norman Sissenwine. U.S. Office of the Quartermaster General. Military Planning Division. Research and Development Branch. Environmental Protection Section. Mar 1950. 8p. Order from LC. Mi $1.80, ph $1.80. PB 124725

Unclassified 25 Oct 1956. 1. Climate - Effect on military equipment 2. Equipment, Army - Effect of humidity 3. QMC EP SR 35

ELECTRICAL MACHINERY

Communication Equipment

Method for measuring fine details of differences in the structure of various speech sound spectrums, by F. Vilbig. U.S. Air Force. Air Research and Development Command. Cambridge Research Center. Electronics Research Directorate. Communications Laboratory, Bedford, Mass. Nov 1956. 10p photos, diagrs. Order from LC. Mi $1.80, ph $1.80. PB 126375

AD 110198. Presented at the 52d meeting of the Acoustical Society of America at Los Angeles, Calif. Nov 15-17, 1956. 1. Spectra, Acoustic - Analysis 2. Speech - Visual presentation 3. Analyzers, Speech 4. AF CRC TR 56-122

On the extraction of noise-like signals from a noisy background from the risk point of view, by Neil Ashby. U.S. Air Force. Air Research and Development Command. Cambridge Research Center. Electronics Research Directorate. Components and Techniques Laboratory, Bedford, Mass. Dec 1956. 35p graphs. Order from LC. Mi $3.00, ph $6.30. PB 126376

Message reliability is formulated in terms of risk, or average cost, associated with the process of extraction of random signals from a white-noise background. The optimum extraction process is obtained for cost criteria of different forms, and expressions for the corresponding risk are presented, together with curves which show their dependence on the signal-to-noise ratio. Extension of the theory to more general cases is briefly considered. AD 110200. AF CRC TR 56-123.

Electronics

Antennas for the extreme-distance range of VHF ionospheric-scatter propagation. Page Communications Engineers, Inc., Washington, D.C. Nov 1955. 92p diagrs, graphs, tables. Order from LC. Mi $5.40, ph $15.30. PB 126147

This report states the results of a study of various antenna types having characteristics suitable for use in VHF ionospheric scatter applications for point-to-point communications over distances of approximately 1900 to 2200 kilometers. PCE-R-3062. Contract AF 19(604)-1530, Final report.

Circular-polarization modification kit for airport surveillance radar ASR-3. Interim engineering report for Apr - Jun 1955 under Contract AF 30(602)-782, by W.B. Offutt. Airborne Instruments Laboratory, Inc., Mineola, N.Y. Jul 1955. 5p. Order from LC. Mi $1.80, ph $1.80. PB 124735

AD 71245. Report 2746-I-8. 1. ASR-3 (Radar) 2. Antennas, Radar - Polarization

Development of "standardized" series of impregnated paper dielectric condensers (capacitors) (Développement de séries "normalisées" de condensateurs au papier imprégné), by C.M. Laurent. Translated and edited by F.A. Raven. Sep 1956. 54p photos, drawings, diagrs, graphs, tables. Order from LC. Mi $3.60, ph $9.30. PB 124802

The present article describes the technical and technological elements which served as a basis for the evolution of two series of metal foil/paper condensers encased in metal housings (parallelipiped shape in one case, and tubular in the other). These items are comparable to better foreign products of the same type. Translated from L'Onde Électrique, vol. 36, no. 348, Mar 1956, p. 194-213. STS 246. NAVSHIPS T 619.

Dielectric plate array, a new endfire antenna, by J.O. Pullman. U.S. Naval Research Laboratory. Jan 1958. 22p photos, diagrs, graphs. Order from OTS. 75 cents. PB 131473

A new endfire element, the dielectric plate, has been experimentally investigated. Endfire arrays of these plates have been found to yield gains and beamwidths otherwise unattainable in a given volume as well as a measure of sidelobe control. The plate arrays have the property that whatever broadside aperture is available may be used to advantage. In this respect they combine the characteristics of endfire and of aperture antennas. Beamwidths have, in fact, been empirically related to the volume occupied by the array. Patterns calculated by conventional means have shown good agreement with the experimental data. NRL R 5068.

Electromagnetic research at the Institute of Mathematical Sciences of New York University, by Morris Kline. New York University. Institute of Mathematical Sciences. Division of Electromagnetic Research, New York, N.Y. Jul 1956. 20p. Order from LC. Mi $2.40, ph $3.30. PB 126370

This paper presents current electromagnetic research efforts and research completed during the past few years at New York University. In the research itself emphasis has been placed on basic problems involving appreciable mathematical methodology. However, this account describes the results from the standpoint of their contribution to microwave problems, ionospheric and tropospheric propagation, diffraction, the inverse propagation and synthesis problems, antenna and waveguide theory, and other physical problems. AD 98788. Contract AF 19(122)-42. AF CRC TN 56-589. NYU RR EM-93.

Evaluation of the trainer-tester and punchboard tutor as electronics trouble-shooting training aids, by Joan H. Cantor and Judson S. Brown. U.S. Naval Training Device Center, Port Washington, N.Y. Oct 1956. 67p photos, diagrs, tables. Order from OTS. $1.75. PB 131391

Research was undertaken to evaluate the effectiveness of specified paper-and-pencil training aids in teaching elementary electronics trouble-shooting. A major finding was that students who used the trainer-tester and the punchboard tutor were superior to the students who used equipment only. NAVTRADEVCEN project 20-F-14. Contract Nonr-1257(02) with George Peabody. College for Teachers, Nashville, Tenn. SDC TR 1257-2-1.

Experimental study of the "hash" in a fluorescent tube. Part I, by Max Hoyaux and Paul Gans. Ateliers de Constructions Electriques de Charleroi. n.d. 49p graphs (part fold). Order from LC. Mi $3.30, ph $7.80. PB 125987

The phenomenon of "hash" in fluorescent tubes has been studied experimentally by means of the high resolution plasmograph. The phenomena observed are extremely complex and have not as yet permitted very definite conclusions to be drawn. The physical phenomena associated with the "hash" are located in the vinicity of the anode. A more or less periodic variation of the anode fall in potential which comprises a relatively slow rise (about 10 volts in 300 microseconds) has been observed, followed by a very sharp fall the rate of which is beyond the limits of resolution of the plasmograph (2 microseconds). AD 88040. Date is 1953 or later. Appendix: Experimental determination of electron temperature. Contract AF 61(514)-630-C. AF OSR TN 56-231. EOARDC TN 55-7.

Fundamentals in noise source calibrations at microwave frequencies, by J. Edwin Sees. U.S. Naval

Research Laboratory. Jan 1958. 24p diagrs, graphs. Order from OTS. 75 cents.
PB 131367

Discusses receiver noise factor, principles employed in noise source calibrations, critical parameters and errors, and hot-body noise sources and their use as standards. NRL R 5051.

Hypersonic shock tube, by Y. A. Yoler. California Institute of Technology. Guggenheim Aeronautical Laboratory. Hypersonic Wind Tunnel, Pasadena, Calif. Jul 1954. 183p photos, graphs. Order from LC. Mi $8.40, ph $28.80.
PB 126833

Theoretical and experimental studies were made of the feasibility of using a shock tube for quantitative investigations of hypersonic flow phenomena at temperatures simulating free-flight conditions. Discussions are given of methods of producing high Mach numbers, limitations on the test section Mach number, methods of generating strong shock waves, flows with variable specific heats and dissociation, and types of problems amenable to study with the hypersonic shock tube. The experimental investigations to date have dealt with pressure studies using piezoelectric gages and schlieren studies of the flow. Contract DA-04-495-Ord-19. CIT GAL M 18.

Improvements in the vibrating condenser method of measuring contact potential differences, by K. Bewig. U.S. Naval Research Laboratory. Feb 1958. 10p diagrs, graphs, table. Order from OTS. 50 cents. PB 131530

A widely used modification of the Kelvin method measures the contact difference of potential between two metals by making them the plates of a vibrating condenser and measuring the resulting alternating current flowing in an interconnecting resistor. Such an apparatus is described in which the time changes of the potential difference are to be observed in various controlled gaseous atmospheres. This report describes the factors which influence the improvement of the sensitivity and the stability of the apparatus. A routine reset accuracy of better than ± 1 millivolt has been obtained in the determination of the contact potential difference. With stabilized, aged condenser electrodes in a constant atmosphere, an overall stability of ±5 millivolts was measured for a 96-hour period of time. NRL R 5096.

NEL reliability bibliography. See entry under Bibliography on page 183 and 184. PB 121838

On the approximation of arbitrary phase-frequency characteristics, by Victor H. Grinich. Stanford University. Electronics Research Laboratory, Stanford, Calif. May 1953. 151p diagrs, graphs, tables. Order from LC. Mi $7.50, ph $24.30.
PB 126342

Contents: The Taylor approximation in the low-interval. - An outline of Darlington's approximation method by Chebyshev polynomial series. - The "Chebysheve" approximation of an arbitrary low-interval phase. - The Taylor approximation of an arbitrary band-interval phase. - The Taylor approximation for band-interval attenuation phase. - Transformations using elliptic functions. - Examples of band-interval "Chebyshev" approximation. - Some mathematical notes. - Conclusions. - Appendix A: Notes on some Chebyshev approximations. Appendix B: The "delay" functions. AD 12808. Contract N6 onr 251(T.O. 7), NR 073-360. SU ERL TR 61.

Operating characteristics of multivibrators and gates and related matters. Progress report no. 2. Rensselaer Polytechnic Institute, Troy, N.Y. 1945. 103p diagrs, graphs. Order from LC. Mi $5.70, ph $16.80. PB 126932

Work is reported on: 1. Completion of equipment for precise study of waveforms and stability of triggered gates. 2. Compensation of supply voltag variations in multivibrators. 3. Compensated control of ratio between on and off times for multivibrators. Declassified Mar 13, 1946. Contract OEM sr-781, Progress report no. 2. NDRC 14-155.

Performing research on new approaches to printed circuitry. Scientific report no. 2, 1 Jun 1956 through 31 Aug 1956 under Contract AF 19(604)-1736, by John H. Dessauer, Frederick A. Schwertz and others. Haloid Company, Rochester, N.Y. Sep 1956. 32p photos, graphs, tables. Order from LC. Mi $3.00, ph $6.30.
PB 126412

Operative capacitors, resistors, and connective circuit patterns have been made by vacuum evaporation. Improvement of the elements by various changes in techniques and materials has constituted the principle effort. Mechanical and temperature characteristics of electroplated ceramic circuit patterns have been studied. Samples withstood severe abrasion, temperatures as high as 500°C., and high electric currents without detriment except normal oxidation. All metal screen type stencils were formed by a hot dip process and subsequent selective etching. Results show that a stencil of long life, high temperature resistance, and special versatility suitable for printing electronic circuits can be made. Trials of usual xerographic techniques in the direct formation of metal patterns were unsuccessful. An investigation of special surface films produced by chemical treatment was begun. For reports nos. 1 and 4 see PB 126122 and 131366. AF CRC TN 56-968.

Phase and gain matched two-channel receiver with signal selection by local oscillator tuning only, by Harold D. Webb. Illinois. Engineering Experiment Station. Electrical Engineering Research Laboratory, Urbana, Ill. May 1956.

41p diagrs, graphs, tables. Order from LC. Mi $3.30, ph $7.80. PB 126677

The principles of a matched-channel receiver for RDF applications are described wherein the incoming signal selection is made by local oscillator tuning only. Several of the design problems are discussed, especially those dealing with the input circuit and phase and gain matching. The design data and circuits for various parts of the receiver are given. Contract Nonr 1834(02), NR 371-161. ILU EES TR 1.

Potential analogy as applied to a driving point immittance function, by Eli M. Goldfarb. Stanford University. Electronics Research Laboratory, Stanford, Calif. Dec 1952. 89p diagrs, graphs. Order from LC. Mi $4.80, ph $13.80. PB 126299

The synthesis of a driving point immittance with a magnitude that is approximately constant over a specified band of frequencies is developed for use in interstage and feedback networks. AD 3548. Contract N6 onr 251, T.O. 7, NR 073-360. SU ERL TR 56.

QK-170 10 megawatt S-band pulsed magnetron. Final report for the period 15 Jul 1952 - 25 Sep 1953 under Contract DA-36-039-SC-15382, by William C. Brown. Raytheon Manufacturing Co., Waltham, Mass. Sep 1953. 56p photos, drawings, diagrs, graphs (part fold), tables. Order from LC. Mi $3.60, ph $9.30. PB 124760

This is a final summary report on the continued development of the QK-170, a ten megawatt, .001 duty cycle, Sg band magnetron. Signal Corps project: 27-322A. Dept. of the Army project: 3-19-03-021. Contract DA 36-039-sc-15382, Final report. Continues work performed under Contract DA 36-039-sc-69.

Quarterly progress report, 32nd, for the period ending 30 Nov 1953, under Contract DA 36-039-sc-100, by J.B. Wiesner, G.G. Harvey and others. Massachusetts Institute of Technology. Research Laboratory of Electronics, Cambridge, Mass. Jan 1954. 104p photos, drawings, diagrs, graphs. Order from LC. Mi $5.70, ph $16.80. PB 126851

Reports progress of research on 22 major subjects, including physical electronics, solid state physics, low temperature physics, microwave tube research, multipath transmission, surface waves, visual replacement projects, communications biophysics, analog computer research, and related subjects.

Radio echoes from auroral ionization detected at relatively low geomagnetic latitudes, by R.L. Leadabrand. Stanford University. Radio Propagation Laboratory, Stanford, Calif. Dec 1955. 203p photos, diagrs, graphs, table. Order from LC. Mi $9,30, ph $31.80. PB 126332

Contents: I. Theories of aurorae and summary of radio results to date. - II. Long-range auroral-zone echoes. - III. Low-latitude auroral effect. - IV. Recommendations for further study. - V. Summary and conclusions. - Appendices: (A) Previous radio studies of aurorae. - (B) Equipment. - (C) Plane-earth plane-ionosphere ray path derivations. - (D) Curved-earth curved-ionosphere ray path derivations. - Bibliographical references. Contract N6 onr 251(07), NR 373-360. Contract DA 04-200-ORD-181. SU RPL TR 98.

Radio set AN/MRC-47. U.S. Marine Corps Equipment Board. Apr 1955. 37p photos. Order from LC. Mi $3.00, ph $6.30. PB 126223

1. AN/MRC-47 (Radio set) 2. Radio - Tests
3. MC EB Proj. T-1144

Reflection of electromagnetic waves from thin metal strips (passive antennae), by Kristen Lindroth. Sweden. Kungl. Tekniska Högskolan, Stockholm. 1955. 64p diagrs, graphs. Order from LC. Mi $3.90, ph $10.80. PB 124920

By solving the integral equation of Hallén it is possible to compute the current which is caused in a straight thin metal strip by an outside incidental electromagnetic field. The present work deals with various methods for approximately solving the integral equation, and the current is represented both in the form of standing waves and in the form of waves continuously reflected. The radiation caused by the current arising has been computed. Electrical engineering series, vol. 6, no. 7. Sweden. Kungl. Tekniska Högskolan, Stockholm. Handlingar nr. 91. Acta polytechnica 178.

Reports, technical publications, etc. from Texas. University. Electrical Engineering Laboratory. See entry under Bibliography on page 184. PB 120412s

Research to investigate the feasibility of electron mirror microscopy in the study of magnetic domains, by Ludwig J. Mayer. General Mills, Inc. Mechanical Division, Minneapolis, Minn. Sep 1957. 32p photos, drawings. Order from OTS. $1.00. PB 131624

The purpose of the research reported here was to find out if it is possible to utilize electron mirror microscopy for pictorial representation of magnetic patterns in general and of magnetic domains in particular. After establishing the basic facts of image contrast formation with types of artificial specimens, experimentation proceeded to specimens actually containing magnetic domains. The magnetic materials used for the purpose were barium ferrite and nickel ferrite. Samples of electron mirror micro-

graphs of domain pattern of these materials are shown in this report and are compared with domain patterns of the same specimen areas obtained by the conventional powder technique. The identical nature of the configurations on both types of micrograph provided final proof of the feasibility of electron mirror microscopy in depicting magnetic patterns. An elementary theory of image contrast formation is included in this report. AD 131084. Project 7021, Task 70651. Covers period 1 Oct 1956 to 27 Sep 1957 under Contract AF 33(616)-3852. AF WADC TR 57-585.

Steady state response of a single tuned parallel circuit to a sinusoidal current source with periodic pulse frequency modulation, by E. Weber. Polytechnic Institute of Brooklyn. Microwave Research Institute, Brooklyn, N.Y. Apr 1955. 35p diagr, graphs. Order from LC. Mi $3.00, ph $6.30. PB 126150

The steady state expression of the voltage across a single tuned parallel circuit fed by a current source possessing periodic pulse frequency modulation is computed in the case of relative frequency deviation less than or equal to one. The corresponding envelope and instantaneous frequency are derived and plotted for certain numerical examples. Presented to a conference at the Symposium "La théorie et la technique des impulsions," Paris, France, Oct 1953. Contract N6 ori-98, T.O. 4, NR 075-214. PIB 331. PIB R 398-54.

Study of semiconductor materials and devices. Second quarterly interim technical report Jan 1, 1956 to Mar 31, 1956, under Contract Nobsr-72537. Raytheon Manufacturing Co. Research Division, Waltham, Mass. Apr 1956. 47p photo, diagrs, graphs, tables. Order from LC. Mi $3.30, ph $7.80. PB 129686

The effects of heat treatment at 1300°C on the infrared absorption of silicon have been investigated. Conductance measurements were made on p-type silicon samples before and after oxidation. Silicon n-p-n diffused base transistors were made by diffusion and alloying. When germanium grown junction diodes are placed in 100 per cent humidity ambients, reverse currents 10 times or more higher than the saturation current are obtained. Index no. NE-110458, Subtask no. 4. Continuation of work done under Contract Nobsr-57323.

Study of the generation and detection of electromagnetic waves in the millimeter wave region. Scientific report no. 6 for the period 1 Sep 1956 to 30 Nov 1956, under Contract AF 19(604)-1115, by J.H. Rohrbaugh. New York University. Washington Square College of Arts and Science. Physics Dept. Dec 1956. 26p. Order from LC. Mi $2.70, ph $4.80. PB 126373

Preliminary, and promising, results are given on a new, smaller bolometer made from 10μ inch wire in .022" x .045" guide. The three-dimensional physical calculation of diffraction from an echelette grating is presented, the result at present being exact but difficult to apply. Further results are also given for the calculations being done on a UNIVAC of the optical constants of simple crystals. A new method for determing the complex index of refraction of solids is also included. AD 110192. For 1st-5th reports under this Contract see PB 116645, 116990, 117767, 119237, 123401. AF CRC TN 56-992.

Traversal of the intermediate state of a superconductor by adiabatic magnetization, by R.L. Dolecek. U.S. Naval Research Laboratory. Jan 1958. 19p graphs, table. Order from OTS. 50 cents. PB 131485

A study has been made of the adiabatic suppression of superconductivity by the application of a magnetic field. The effects of specimen geometry, rate of magnetization, and departures from the isentropic magnetization path were studied. The excessive heating accompanying adiabatic magnetization was found to arise from thermal effects along the magnetization path associated with hysteresis in the magnetization path. When these hysteresis effects are included in calculations of expected values of cooling, good agreement with experimentally observed values is achieved. The exact nature of the hysteresis effect is unknown. Unless control of this irreversibility is possible, the cooling of a superconductor by adiabatic magnetization cannot be utilized effectively for refrigeration nor for producing temperatures much below one degree Kelvin. NRL R 5081.

Generators, Motors, Transmission

Analysis and synthesis of grounded-grid amplifier transfer functions, by Warren A. Christopherson. Stanford University. Electronics Research Laboratory, Stanford, Calif. May 1952. 135p diagrs, graphs, tables. Order from LC. Mi $6.90, ph $21.30. PB 126343

Contents: I. Introduction. - II. The analysis of grounded-grid amplifiers. - III. The synthesis of grounded-grid amplifier transfer functions. - IV. Design equations and alignment procedure. - V. The design and performance of a grounded-grid amplifier. - VI. Conclusions. AD 154480. Contract N6 onr-251(T.O. 7), NR 078-360. SU ERL TR 46.

Influence of magnetic saturation on transients and voltage regulating properties of synchronous alternators, with special reference to large capacitive loads, by Erkki Voipio. Sweden. Kungl. Tekniska Högskolan, Stockholm. 1955. 126p photos, diagrs, graphs, tables. Order from LC. Mi $6.30, ph $19.80. PB 124923

In order to investigate the effect of saturation on transients and on voltage regulating properties, transients in a linear machine are compared with those in a machine with saturation. The usual methods for treating a linear machine are developed so that the additional complications arising from losses in the stator circuit and from the damper-winding on the rotor are taken into account. The stability conditions in connection with an actual high-speed regulator are also considered. The effect of saturation on transients is shown by a number of examples and experimental recordings. The stability limit with capacitive impedance load is calculated and checked by tests. Where relevant to working with long lines, practical aspects are discussed. Electrical engineering series vol. 6, no. 9. Sweden. Kungl. Tekniska Högskolan, Stockholm, Handlingar nr. 93. Acta polytechnica 181.

Maximally flat amplifiers of arbitrary bandwidth and coupling, by DeForest L. Trautman. Stanford University. Electronics Research Laboratory, Stanford, Calif. Feb 1952. 145p diagrs, graphs, table. Order from LC. Mi $7.20, ph $22.80. PB 126300

This approach to network synthesis offers a relatively simple geometric situation in which synthesis is accomplished by arranging points on a plane. The two main techniques to be developed are, first, the explicit visual handling on the complex frequency plane of poles and zeroes of the network transfer function, and second, the application of this visualization to network synthesis through mappings of function theory, in conjunction with a striking potential analogy. This method is applied to a class of bandpass amplifier interstage networks. AD 148535. Contract N6 onr-251 (07), NR 078-360. SU ERL TR 41.

Miscellaneous

Bubbles produced by submerged exploding wires, by Jacob B. Gilstein. New York University. College of Engineering. Research Division, New York, N.Y. Dec 1955. 33p photos, drawing, diagr, graphs, tables. Order from LC. Mi $3.00, ph $6.30. PB 124681

A method for producing bubbles in a liquid by means of exploding wires is described. Tests were performed in which a certain fixed amount of energy was available from a bank of charged condensers. The fraction of this energy which was apportioned to the bubble was determined as a function of the wire length and diameter over a certain range of values. A discussion of various hypotheses concerning the formation and growth of a vapor bubble from an exploding wire is given. There is insufficient information obtained from the tests reported herein to provide a base for a complete analysis. Some suggestions for an extension of these tests are offered. Contract Nonr-28523, NR 062-193.

Investigations on utilization of radioactive energy as a source of battery power. Quarterly report no. 1 (No. 9 in series), 1 Aug 1954 to 31 Oct 1954 under Contract DA 36-039-sc-64519, by Alexander Thomas. Tracerlab, Inc., Boston, Mass. Oct 1954. 41p photos, graphs, tables. Order from LC. Mi $3.30, ph $7.80. PB 130243

Newly developed techniques of preparation of relatively large area electrode couple sheets from the point of view of cleaning the stainless steel base, anodizing, and evaporating magnesium on one side are described. The advantages of couples made in this manner over welded couples are given and a comparison of CPD measurements on both types is presented and analyzed. A new program of investigating promising insulators is discussed in detail. The importance of this program is reinforced by experimental evidence that the high voltage terminal of battery models must be potted. AD 63670. D.A. Project 3-99-09-022. Signal Corps Project 162B.

FUELS AND LUBRICANTS

Bibliography of fuel stability. See entry under Bibliography on page 183. PB 131482

Boundary layer effects on stability characteristics of bluff-body flameholders, by G.C. Williams, P.T. Woo and C.W. Shipman. Massachusetts Institute of Technology, Cambridge, Mass. Jun 1956. 34p graphs. Order from LC. Mi $3.00, ph $6.30. PB 127953

As a means of examining further the mechanism of flame initiation, it was decided to eliminate the argument dependent on low velocity unburned gas by removing the boundary layer from a bluff body used as a stabilizer, and to measure the effects on limits of stable operation and composition of immediate wake. Includes description of apparatus used. Submitted for presentation at the 6th International Symposium on Combustion, to be held at Yale University, Aug 19-24, 1956. Contract N6 ori-105, T.O. III, NR 098-038. MIT-10-P.

Calculated performance of hydrocarbon-white fuming nitric acid propellants at high chamber pressures, by C.H. Trent and M.J. Zucrow. Purdue University. Purdue Research Foundation, Lafayette, Ind. Mar 1949. 43p graphs, tables. Order from LC. Mi $3.30, ph $7.80. PB 126286

The values of specific impulse for heptane, octane, decane, and eicosane oxidized by white fuming nitric acid have been calculated at chamber pressures ranging from 300 psia to 2058 psia. The effects of varying the C/H ratio of the fuel, the combustion pressure, and the oxidizer to fuel ratio on the specific impulse and on the temperature of combustion were determined. Based on Thesis by C.H.

Trent, Purdue University, Aug 1948 (Confidential). Project Squid. Contract N6 ori-104, T.O. I, NR 220-042. PUR-6-M.

Construction of wave diagrams to study the propagation of flame fronts in ducts, by George Rudinger and Leonard D. Rinaldi. Cornell Aeronautical Laboratory, Inc., Buffalo, N.Y. Nov 1948. 38p photos, diagrs, graphs. Order from LC. Mi $3.00, ph $6.30. PB 127964

Extends the method of wave diagrams used to study one-dimensional and non-steady gas flow, as described in PB 128898, to include the propagation of flames in ducts of constant cross section. The effective burning velocity is assumed to be independent of pressure and proportional to the absolute temperature of the unburned gas. Examples are given to illustrate the procedure. ATI 61586. Contract N6 ori-119, NR 220-041. CAL TM 23. CAL DD-420-A-23.

Effects of additives on pressure changes in thermal reaction of acetylene, by Gene Morrow and R.C. Anderson. Texas. University. Dept. of Chemistry, Austin, Tex. Oct 1956. 20p diagr, graphs, table. Order from LC. Mi $2.40, ph $3.30. PB 124974

Comparative studies have been made of the pressure changes occurring during thermal reaction of acetylene alone and in the presence of certain additives. These results show that the pressure effect is not a factor in the influence of benzene and propane on flame propagation in the decomposition of acetylene. The effects of other hydrocarbon types, such as cyclo-octatetraene, anthracene, pyrene, etc., were also tested for later comparison with propagation data. AD 110307. AF OSR Chem 50-1. Technical note 32. Contract AF 18(600)-430. AF OSR TN 56-493.

Exploratory studies of the acetylene-ethylene oxide combustion systems, by Robert Pratt, M.S.B. Munson and Robbin C. Anderson. Texas. University. Dept. of Chemistry, Austin, Tex. Oct 1956. 8p graphs. Order from LC. Mi $1.80, ph $1.80. PB 124973

Since earlier experiments showed ethylene oxide to have a marked effect on flames in acetylene and since both these substances can give decomposition flames, the acetylene-ethylene oxide system offers interesting potentialities for study of a system in which flames may be possible in mixtures of any composition. Exploratory experiments have been made on flame propagation in tubes at 300° initial temperature and varying pressures. AD 110502. AF OSR Chem 50-1. Technical note 33. Contract AF 18(600)-430. AF OSR TN 56-502.

Final report under Contract AF 18(600)-430, 3 Sep 1952 - 30 Sep 1956, by R.C. Anderson, Lewis F. Hatch and F.A. Matsen. Texas. University. Dept of Chemistry, Austin, Tex. Dec 1956. 20p table. Order from LC. Mi $2.40, ph $3.30. PB 126305

Results of the investigations of kinetics of elementa processes in flames, particularly the self-combustion or decomposition flames of acetylene, carried out under this contract are summarized briefly. A bibliography of the technical notes, theses and dissertations, and outside publications which give the details of the work is given. The nature of the reaction mechanisms involved in flame propagation is discussed. AD 115028. AF/OSR/Chem 50-1. Con tinues work begun under Contract AF 33(038)-21745 For other reports under this Contract see PB 12142 122196, 122198, 122200 and 124845. AF OSR TN 56-63.

Flame propagation in cylindrical tubes near the quenching limit, by J.M. Singer and G. von Elbe U.S. Bureau of Mines, Pittsburgh, Pa. Aug 1956 15p photos, diagrs, graphs. Order from LC. Mi $2.40, ph $3.30. PB 127957

Flame propagation through various methane-air mi tures contained in tubes of near quenching distance have been studied. The tubes were mounted vertically; the lower end was closed and the flame propagated downward from the open to the closed end. According to Lewis and von Elbe's theory of the structure of combustion waves near solid surfaces the axial burning velocity and hence the linear flame speed at quenching are approximately equal to the standard burning velocity. To test this theory, linear flame speeds at near quenching limits were obtained experimentally. Also, the corresponding dead space distance between flame and inside wall was measured and compared with the value predicted from theory. In addition, dead space distances were compared with the interconal distances between schlieren and luminous outlines of burner flames. Presented at the 6th International Combustion Symposium at Yale University, New Haven, Conn. 19-25 Aug 1956. Project Squid. Contract N6 ori-105, T.O. III, NR 098-038. BM-15-P.

Flame stabilization in a boundary layer, by Hoyt C. Hottel, Tau-Yi Toong and John J. Martin. Massachusetts Institute of Technology, Cambridge, Mass. Oct 1956. 16p drawings, graphs. Order from LC. Mi $2.40, ph $3.30. PB 127959

The theory of flame stabilization is examined by studying the stability of a lean propane-air flame in the boundary layer along a water-cooled slender rod, with its longitudinal axis lying at the center line of a large pyrex duct. The extraneous dilution effect due to surrounding atmosphere present in the study of the stability of a Bunsen flame is thus eliminated. The position of the flame from the leading edge of the slender rod is found to be independent of the rod position inside the duct and of the duct length, unless the flame is stabilized within two inches of the duct exit. The distance between the flame and the leading edge of the rod decreases as the free-stream

mixture velocity decreases, the rod-coolant temperature increases, and the propane-air ratio increases from lean toward the stoichiometric value. Presented at the American Rocket Society Fall meeting, Buffalo, N.Y., Sep 24-26, 1956. Project Squid. Contract N6 ori 105, T.O. III, NR 098-038. MIT-13-P.

Flame stabilization in volatile fuel sprays, by H.C. Hottel, C.P. Marion and W.P. Jensen. Massachusetts Institute of Technology, Cambridge, Mass. Jun 1956. 47p drawings, graphs. Order from LC. Mi $3.30, ph $7.80. PB 126275

The flame-holding properties of a cylindrical rod in high-velocity streams of air containing fuel droplets have been studied to determine the effect of fuel volatility on flame stabilization. This research extends a previously reported study of the effects of fuel droplets on stabilization under conditions of negligible vaporization prior to droplet impact on the stabilizer. Submitted for possible presentation at 6th International Combustion Symposium, New Haven, Aug 1956. Project Squid. Contract N6 ori 105, T.O. III, NR 098-038. MIT-12-P.

Formation of nitric oxide in flame calculations for methane-oxygen nitrogen mixtures, by Richard S. Brokaw. Princeton University. Dept. of Chemistry, Princeton, N.J. Jul 1948. 7p graph. Order from LC. Mi $1.80, ph $1.80. PB 126278

Calculations have been made to ascertain the equilibrium concentrations of nitric oxide in methane-oxygen-nitrogen flames. Under optimum conditions about 2.2% nitric oxide may be formed. The calculations are in qualitative agreement with experimental data in the literature. Technical paper no. 10. Under joint sponsorship of Projects Bumblebee (Nord 7920, Task PRN-3) and Squid. Contract Nord 7920. Contract N6 ori-105, T.O. III, Phase 2, NR 220-038. PU TM-7-M.

On time and space functions of heat input necessary to produce, in a tube, waves of density, velocity, pressure, temperature, momentum and periodic thrust of required character, by H.J. Reissner. Polytechnic Institute of Brooklyn, Brooklyn, N.Y. Jul 1948. 28p graphs. Order from LC. Mi $2.70, ph $4.80. PB 127949

The theory presented in this paper is concerned only with the averages of the flow variables across each cross section of the duct, so that a spatially one-dimensional analysis (but two dimensional in space and time) can be applied. It is intended in this paper to formulate a method to determine, for any time function of inflow velocity and for any chosen flight speed condition, such time and space distribution of heat input, that pressure functions yielding high thrust are produced. Project Squid. Contract N6 ori-98, T.O. II, NR 220-039. PIB TM 12.

Outlook and research possibilities for bituminous coal. U.S. Bureau of Mines, and Bituminous Coal Research, Inc. May 1956. 59p graphs, tables (part fold). Order from Bureau of Mines, 4800 Forbes Street, Pittsburgh 13, Pa. PB 124817

1. Coal, Bituminous - Research 2. Coal, Bituminous - Production 3. BM IC 7754

Polynuclear aromatic compounds for high temperature lubricants, by Charles F. Raley, Jr. Southwest Research Institute, San Antonio, Tex. Nov 1953. 50p tables. Order from LC. Mi $3.30, ph $7.80. PB 130242

A literature survey covering the field of polynuclear aromatic compounds, with two or three nuclear rings, was made. From the data thus gathered, a list of seventeen compounds, considered to be representative of the common chemical structures, was compiled. These compounds were synthesized and evaluated as to thermal stability, viscosity at 100°F., 210°F., density, and boiling point. On the basis of this evaluation, the field of aryl phosphates was considered to have the most likely chance of providing compounds with the desired properties. Further research in this field has produced three liquid compounds with exceptional thermal stabilities, i.e., above 700°F.; di-p-tolyl 1-naphthyl phosphate, di-m-tolyl 1-naphthyl phosphate, and tri-o-chlorophenyl phosphate. Contract AF 33 (616)-276. AF WADC TR 53-337.

Shock tube study of flame front-pressure wave interaction, by G.H. Markstein. Cornell Aeronautical Laboratory, Inc., Buffalo, N.Y. Aug 1956. 38p photos, drawings, graphs. Order from LC. Mi $3.00, ph $6.30. PB 127956

Studies the effects of externally generated pressure disturbances of simple wave shape on flames propagating in tubes. The flame is subjected to shock wave disturbances. The design of the apparatus does not permit the study of the interaction of a single shock wave within the flame, but rather that of a head-on collision between flame and shock wave followed by interaction with the wave transmitted by the flame and reflected at the bottom of the combustion chamber. To be presented at the 6th International Combustion Symposium at Yale University, New Haven, Conn. 19-25 Aug 1956. Contract N6 ori-105, T.O. III, NR 098-038. Project Squid. CAL TR 68-P.

Size distribution of droplets from grooved-core centrifugal pressure nozzles, by A.P. Roy Choudhury, G.G. Lamb and W.F. Stevens. Northwestern Technological Institute, Evanston, Ill. May 1956. 26p graphs. Order from LC. Mi $2.70, ph $4.80. PB 127952

This paper presents a new correlation for drop-size distribution data, based on experimental re-

sults obtained by means of a unique technique which seems to be unusually reproducible. Using this new correlation, it should be possible to predict in advance the drop-size distribution data to be expected from a particular pressure nozzle, knowing only the physical properties of the fuel to be sprayed and the dimensions and capacity of the centrifugal pressure nozzle to be employed. Project Squid, Technical report NTI-4-P. Submitted for presentation at the 6th International Symposium on Combustion to be held at Yale University, Aug 19-24, 1956. Contract N6 ori-105, Task order III, NR 098-038.

HIGHWAYS AND BRIDGES

Parking and its relationships to business. Summary report of project, by J.T. Stegmaier. Highway Research Board. 1956. 22p graphs, table. Order as HRB SR 11-D from National Research Council Publications Office, 2101 Constitution Ave., N.W., Washington 25, D.C. 60 cents. PB 124737

Supplement to Bulletin 11 (PB 113730). 1. Automobiles - Parking 2. Business centers - Decentralization 3. HRB SR 11-D 4. NRC 273d

Roadside development. Highway Research Board. 1956. 76p photos, tables. Order as NRC 419 from National Research Council Publications Office, 2101 Constitution Ave., N.W., Washington 25, D.C. $1.35. PB 124738

Presented at the thirty-fifth annual meeting, Jan 17-20, 1956. For earlier reports see PB 114888 and 118264. 1. Roads - Roadside development 2. NRC 419

Trafficability of soils. Summary of trafficability studies through 1955, by S.J. Knight. U.S. Waterways Experiment Station, Vicksburg, Miss. Dec 1956. 143p photos, maps (1 fold), drawing, graphs, tables. Order as Technical memorandum 3-240, suppl. 14 from Waterways Experiment Station, Vicksburg, Miss. $1.00. PB 129708

The trafficability factors, bearing and traction capacity, are functions of shearing strength. A simple instrument, the cone penetrometer, measures an index of shear strength. Cone indexes on fine-grained soils and sands with fines, poorly drained, are related to vehicle performance, but an auxiliary test, remolding, must accompany the cone penetrometer test to predict changes in cone index under traffic. Slipperiness and stickiness cannot be measured, but can be anticipated approximately from simple soil tests. Tests with wheeled vehicles on sands showed fair correlation between maximum slope and cone index with tire pressure duly considered. Means are presented for: classifying soils from the trafficability standpoint; computing cone index required for any military vehicle; quickly estimating maximum slopes vehicles can climb, maximum tow loads, and towing forces required on various soil strengths; making actual trafficability measurements and mapping them for strategic and tactical purposes; and for estimating trafficability without contact with the soil. Project no. 8-70-05-100. Supersedes WES TB 5-550-1, Soils trafficability, dated 20 Aug 1951. Color will not reproduce. WES TM 3-240, Suppl. no. 14.

INSTRUMENTS

Calibration of liquid aerosol collectors by droplets containing uniform-size particles, by N.H. Farlow and F.A. French. U.S. Naval Radiological Defense Laboratory, San Francisco, Calif. May 1955. 16p photos, graphs, tables (1 fold). Order from LC. Mi $2.40, ph $3.30. PB 128179

Through the use of suspensions of single-size solid particles of spores and latex spheres in artificially generated aerosols, a technique was developed for the rapid determination of liquid micro-drop volume which allows the complete calibration of droplet-sensitive films and sampling instruments, in the droplet size range 1 to 100 μ and possibly greater. AD 71518. Bureau of Ships project no. NS 081-001. Technical objective AW-7. USNRDL TR 50.

Computing machine components program. Sixth quarterly report to the Office of Naval Research for Oct - Dec 1953. U.S. Naval Ordnance Laboratory. Computer Components Division, Corona, Calif. May 1954. 54p photos, drawings, diagrs, graphs, tables. Order from LC. Mi $3.60, ph $9.30. PB 126812

The report describes progress during the period covered on the following projects: Magnetic film research, magnetic core applications, ferroelectrics, high frequency circuitry parallel adders, and ferromagnetic resonance. NOLC R 143.

Dependence of precision of a stereoscopic range finder upon the magnification employed, by C. Eisenhart. Columbia University. Applied Mathematics Group, New York, N.Y. Sep 1943. 15p graphs. Order from LC. Mi $2.40, ph $3.30. PB 129682

The object of AMP Study No. 9, Statistical Study of Rangefinders, is to ascertain empirically the manner in which the precision of range estimation with a stereoscopic rangefinder actually depends upon the base length of the rangefinder and the magnification employed. Superseded by NDRC AMG-C-117 (PB 122340). Declassified Dec 17, 1954. NDRC AMG-C Memo 49. NDRC AMP 7184.

Design and performance of a high frequency flutter damper, by B.E. O'Connor and L.H. Geyer. Cornell Aeronautical Laboratory, Inc., and Houdaille Hersey Corporation. Houde Engineering Div., Buffalo, N.Y. n.d. 114p photos, drawings, diagrs, graphs, tables. Order from LC. Mi $6.00, ph $18.30. PB 128162

This report covers the analysis and development of the damper design the test results supporting the analytical conclusions utilized in this development and establishing the acceptability of the final design, and the analytical-experimental correlation of the test system characteristics required to show the validity of the experimental data. HOUDE report no. 510. CAL MM-744-D-1.

Design of a basic electric-tank analogy installation, by W.B. Brower, Jr. and P. DeRienzo. Rensselaer Polytechnic Institute, Troy, N.Y. Sep 1955. 12p photos, diagrs. Order from LC. Mi $2.40, ph $3.30. PB 130319

A description is given of the mechanical and electrical equipment used in a typical electric-tank analogy installation for the study of two-dimensional flows. Contract AF 18(600)-499. RPI-TR-AE 5505. AF OSR TN 55-424.

Development of a 400-cps servo recorder, by Ralph E. Klautsch. ARO Inc., Tullahoma, Tenn. Dec 1957. 21p photos, drawings, diagrs. Order from LC. Mi $2.70, ph $4.80. PB 126273

Measurement of wind tunnel test parameters becomes increasingly difficult as accuracy and resolution requirements are increased. In an effort to improve the existing methods of measuring the outputs of variable-resistance sensing elements under test conditions, a 400-cps null-balance servo system was developed. A general description and a detailed explanation of various curcuits used in this system is given, along with a discussion of certain developmental problems encountered. AD 14321. Aro Project no. 933010. Contract AF 40(600)-700 Sup. 6(58-1). AF AEDC TN 57-47.

Effect of temperature upon the response of a gamma-ray scintillation spectrometer, by L.A. Webb. U.S. Naval Radiological Defense Laboratory, San Francisco, Calif. May 1955. 14p diagrs, graphs. Order from LC. Mi $2.40, ph $3.30. PB 127711

Studies have been made of the effect of temperature upon the scintillation efficiency of NaI(Tl) and the response of a 6292 photomultiplier over the range of 5 to 45°C. The crystals were coupled to the phototube by means of a special light pipe which permitted separate temperature control of the crystal package and of the photomultiplier while the operating condition of all other components remained unchanged. AD 71961. Technical objective AW-7. Bureau of Ships project: NS 081-001, Subtask 4.2. USNRDL TR 48.

Effects of variations in control deadspace and gain on tracking performance, by Marty R. Rockway. U.S. Air Force. Air Research and Development Command. Wright Air Development Center. Aero Medical Laboratory, Wright-Patterson Air Force Base, Dayton, O. Sep 1957. 17p drawings, graphs, tables. Order from OTS. 50 cents. PB 131607

The present experiment was designed to investigate the effects of joint variations in control deadspace and gain on the efficiency of a first-order manual control system. Six experienced subjects performed on a one-dimensional compensatory tracking device using each of the twelve control conditions resulting from combining four levels of control deadspace and three levels of gain. AD 118347. Project no. 7197-71635. Experimental data collected at Ohio State University under Contract AF 339616)-3076. AF WADC TR 57-326.

Electronic target simulator for use with operational radar surveillance systems, by George A. Harter and Peter Gain. Ohio State University. Laboratory of Aviation Psychology, and Ohio State University Research Foundation, Columbus, O. May 1957. 39p photos, drawings, diagrs. Order from OTS. $1.00. PB 131604

An Operational Target Simulation (OTS) system for simulating targets and mixing them with "live" targets on operational PPI-type radar displays is described. Three designs have been proposed. It was in the method used for the transformation of this information from rectangular to polar form that the three designs differed. AD 118261. Project 7192, Task 71596. Contract AF 33(616)-3612. Work was initiated under Contract AF 33(616)-43. AF WADC TR 57-277.

Evaluation of radio interference pick-up devices and explanation of the methods and limits of specification no. MIL-I-6181B. Final report, by W. Jarva. U.S. Naval Air Development Center. Aeronautical Electronic and Electrical Laboratory, Johnsville, Pa. Aug 1955. 30p graphs. Order from LC. Mi $2.70, ph $4.80. PB 129688

TED project no. ADC EL-559. 1. Instruments, Measuring - Radio interference 2. NADC EL 5515

Far infrared imaging devices: Use of the evaporograph to study the radiation from clouds in the far infrared, by David Z. Robinson and Naomi Gold. Baird Associates, Inc., Cambridge, Mass. Sep 1956. 33p col. photo, diagrs, graphs, table. Order from LC. Mi $3.00, ph $6.30. PB 124775

It is the purpose of this paper to describe the instrumentation used to obtain cloud pictures and give the method for obtaining radiation distributions. The relation between temperature and radiation is briefly explored. Finally, the semiquantitative results obtained from various clouds is presented, together with the complete radiation pattern from one particular cloud. Most of the emphasis in this work was placed on obtaining differences in radiation between the cloud and the sky. These differences are what the Evaporograph obtains and special techniques are needed to get absolute values. These differences, however, are important in many problems which involve scanning the sky. AD 110128. Color will not reproduce. Contract AF 19(604)-1111. AF CRC TR 56-173.

Investigation of samplers for the collection and classification of radioactive airborne particulate materials. Mine Safety Appliances Company, Pittsburgh, Pa. Apr 1954. 31p photos, drawings, graphs. Order from LC. Mi $3.00, ph $6.30. PB 126793

The objective of this investigation was the design, construction and testing of prototype samplers which would collect all particles in a dust cloud and would separate the particles into fractions representative of those collected in the upper and lower human respiratory tracts. This report describes three samplers and gives the results of tests made with them. In all three devices impingment was used to collect the larger particles. In two of the samplers, the remaining airborne particles were collected by thermal precipitation, while filtration was used in the third. The results presented indicate that the samplers perform the desired separation. Methods for using similar samplers in determining the relative radioactivity of various size fractions of dusts are suggested. Index no. NE 051554. Contract Nobsr 57527, Task 6.

Linear lumped parameter analysis of synchros. IV: Equivalent circuits for synchro networks, by B. D. Fried. U.S. Naval Ordnance Laboratory, White Oak, Md. Jun 1952. 25p diagrs. Order from LC. Mi $2.70, ph $4.80. PB 127042

Equivalent circuits are given which completely characterize the action of synchro control systems both with and without loads. In previous reports in this series, it was necessary to introduce abstract currents which are now given concrete expression. The equivalent circuits are then used to redevelop the accuracy formulae in terms of impedances. For Parts 1-3, 5, 7-9 see PB 120921, 120852, 120947, 120836, 120884, 120835, 120990. NAVORD 2173.

Monthly progress report under Contract no. DA 36-034-ord-1646, Project no. TB3-0538 and Contract no. Nonr-1358, Task no. NR 044-047. Princeton University. Institute for Advanced Study. Electronic Computer Project, Princeton, N.J. Jun 1956. 5p table. Order from LC. Mi $1.80, ph $1.80. PB 126356

Project no. TB3-0538. For other monthly reports under Contract DA 36-034-ord-1646 see PB 118659-118660, 119072, 120319, 120321, 123155, 123170, 124105, 124164-124166. 1. Computers, Electron 2. Computers, Electronic - Coding 3. Contract DA 36-034-ord-1646 4. Contract N onr-1358, NR 044-047

Notes on tape room procedures, by M. Solomita. Massachusetts Institute of Technology. Digital Computer Laboratory, Cambridge, Mass. Apr 1956. 24p photos, drawings, diagrs, graphs, tables. Order from LC. Mi $1.80, ph $1.80. PB 126410

MIT DCL-71. AD 71466. 1. Tape, Computer 2. Contract N5ori-06001

Preliminary evaluation of a rotating flame stabilize as a means of achieving higher heat-release rates per unit of combustion-chamber volume, by John H. Grover, Michael G. Kesler and Arch C. Sourlock. Atlantic Research Corporation, Alexandria, Va. Oct 1956. 22p photos, drawings, graphs, diagrs, tables. Order from LC. Mi $2.70, ph $4.80. PB 127963

The feasibility of rotating a fluff flameholder as a means of increasing volumetric heat-release rates in high-output combustion chambers has been investigated. The power required to overcome the rotational drag was calculated to be usually less than the losses due to wall-friction or axial drag of the flameholder. Possible applications of rotatin flameholders are discussed. Presented at the American Rocket Society Fall meeting, Buffalo, N.Y., Sep 24-26, 1956. Project Squid. Contract N6 ori 105, T.O. III, NR 098-038. ATRC-2-P.

Subminiaturized magnetic core element digital equipments for a TACS. Interim engineering report for the period 15 Sep 1954 through 15 Dec 1954 under Contract AF 30(602)-1055. Remington Rand, Inc. Engineering Research Associates Division, St. Paul, Minn. Jan 1955. 52p photos, diagrs, (1 fold), graphs, tables. Order from LC. Mi $3.60, ph $9.30. PB 124752

Consists of title-page, figures 17-59 (schematic wiring diagrams and photos). Appendix A: Impedance measurements on a memory line, and Appendix B: Diode tests. Pages are numbered 136-183. Report PX 71767-1. AF CRC TR 56-372.

Time-gated amplitude quantizer for neural signals, an application to electric signals from the auditory nervous system, by Klaus Putter. Massachusetts Institute of Technology. Research Laboratory of Electronics, Cambridge, Mass. Jan 1954. 45p photos, drawing, diagrs, graph,

table. Order from LC. Mi $3.30, ph $7.80. PB 126301

The conventional analysis of electric signals from the auditory nervous system of anesthetized animals is a laborious and time-consuming task. The time-gated amplitude quantizer (TGAQ) automatically quantizes the amplitudes of preselected portions of the signals and makes possible at least a partial analysis during the course of the experiment. Quantization is achieved by an electrocmechanical method. Dept. of the Army project no. 3-99-10-022. Signal Corps project no. 8-102B-0. MIT RLE TR 275.

Use of the conoscope for the inspection of hot-stretched aircraft glazing materials, by Mary J. Kramer. U.S. Naval Research Laboratory. Jul 1957. 34p diagrs, graphs, tables. Order from OTS. $1.00. PB 131174

The purpose of this work was to develop a relatively simple and rapid nondestructive technique for measuring the toughness of hot-stretched aircraft glazing plastics. The conoscope, which uses a divergent beam of polarized light, was found to satisfy the needs of this work. Equations have been developed for calculation of the birefringence of a sheet from measurement of the interference figure formed by the conoscope. Optical components needed for assembling a conoscope are described. Aids for shortening computation are included. NRL R 4989.

Use of the Rayleigh interferometer for the analysis of liquids, by B.J. Berkowitz and Ernest Grunwald. Florida State University. Dept. of Chemistry, Tallahassee, Fla. Feb 1956. 28p diagrs, tables. Order from LC. Mi $2.70, ph $4.80. PB 126439

A method is described for the unambiguous identification of the zero-order fringe. This method requires no modification of the commercially available interferometer, but involves the use of a tungsten light source and of two auxiliary monochromatic sources. The method is also suitable for the measurement of the relative dispersion of liquids; its use is illustrated for aqueous solutions of sodium chloride and sodium p-toluenesulfonate. An interferometer cell for volatile liquids is described. This cell was used in the analysis of dioxane-water mixtures, and an accuracy of 0.006 weight percent was achieved. Contract Nonr-998(02), NR 055-330.

MACHINERY

Effect of the speed governor on stability between synchronous machines, by Dag Jungnell. 1955. 26p diagrs, graphs, table. Order from LC. Mi $2.70, ph $4.80. PB 124922

The effect of speed governors and the influence of the the mass of water on the synchronous stability are investigated. The conditions for stability are given. Electrical engineering series vol. 6, no. 8. Acta Polytechnica 180.

Some causes which may lead to damage of friction bearings in high-speed internal combustion engines (Eenige oorzaken die kunnen leiden tot vernieling van glijlagers in snelloopende motoren), by B.C. Kroon. Translated and edited by F.A. Raven. Sep 1956. 30p photo, table. Order from LC. Mi $2.70, ph $4.80. PB 124794

Translated from Materialkennis, No. 1, 17 Jan 1947, p. 1-8, and No. 3, 21 Mar 1947, p. 25-26 (Supplement to De Ingenieur, vol. 59, nos. 3 and 12). Lecture delivered before the Association for Materials Research of the Netherlands, Committee on Lubrication, 10 Oct 1946 at Utrecht, Germany.
1. Bearings, Friction - Failure - Netherlands
2. Engines, Internal combustion - Performance - Netherlands 3. STS 241 4. NAVSHIPS T 614

Vacuum vessel construction techniques and sealing methods, by D.O. Horning. California. University. Institute of Engineering Research, Berkeley, Calif. May 1951. 36p diagrs, tables. Order from LC. Mi $3.00, ph $6.30. PB 126633

This is Appendix I to a thesis on "The mechanical design, construction, instrumentation and operation of a low density supersonic wind tunnel." This thesis presents engineering problems associated with such a wind tunnel for studies of rarefied gas dynamics. ATI 144081. Report HE 150-84. Contract N7 onr 295, T.O. 3, NR 061-033. UC IER Series 20 Issue no. 77.

MATHEMATICS AND STATISTICAL ANALYSIS

Asymptotic forms of Coulomb wave functions, I, by A. Erdélyi, M. Kennedy, J.L. Mcgregor, with an appendix by C.A. Swanson. California Institute of Technology. Dept. of Mathematics, Pasadena, Calif. 1955. 30p tables. Order from LC. Mi $2.70, ph $4.80. PB 126347

Studies towards obtaining approximations for both regular and irregular Coulomb work functions and their derivatives when the parameter n is large and the variable p is restricted. For other reports under this Contract see PB 123038 and 125171. Contract N onr-220(11), NR 043-121, Technical report no. 4.

Decision procedures for the functional calculus. Supplementary report. ACF Industries, Inc., Avion Division. Research Dept., Alexandria, Va.

Sep 1956. 49p tables. Order from LC. Mi $3.30, ph $7.80. PB 123414s

The purpose of this paper is to develop algorithms by which decision procedures for the functional calculus can be applied mechanically. AD 110123. For earlier reports see PB 123414, 123754 and 124719. Supplement to PB 123414. 1. Contract AF 19(604)-1582. AF CRC TN 56-785

Extensions of numberical transform theory, by Rubin Boxer and Samuel Thaler. U.S. Air Force. Air Research and Development Command. Rome Air Development Center, Griffiss Air Force Base, Rome, N.Y. Nov 1956. 34p diagr, graphs, tables. Order from LC. Mi $3.00, ph $6.30. PB 124761

The z-form method of solving linear and non-linear equations is extended and its greater accuracy as compared with other related methods is demonstrated. The extensions include a method of computing the error; a method of calculating the solution between sampling points; and the use of extrapolation to solve non-linear systems. The procedures presented are illustrated by examples. It is shown that the method of calculating the error is also applicable to related methods such as those suggested by Tustin, Amarel, Truxal, and Wasow. AD97793. AF RADC TR 55-115.

General solutions to the elastic-plastic displacements within a wide curved bar, by Bernard W. Shaffer. New York University. College of Engineering. Research Division, University Heights, N.Y. Oct 1956. 22p diagrs. Order from LC. Mi $2.70, ph $4.80. PB 130163

General expressions are obtained for the displacements and strains within a wide curved bar, fixed at one end and loaded at the other, when the applied loads are sufficiently large to cause the occurrence of an elastic-plastic stress distribution within the bar. Three special cases of loading are considered: a force perpendicular to the fixed plane, a force parallel to the fixed plane, and a bending moment applied within the plane of curvature. It was found that under the influence of the aforementioned forces, plane sections remain plane only if the ratio of wall thickness to centroidal radius is small, whereas planes always remain plane when a pure bending moment is applied. AD 113195. Technical report no. 3. Contract DA 30-069-ORD-1398.

Impact with finite acceleration time of elastic and elastic-plastic beams, by R.C. Alverson. Brown University. Graduate Division of Applied Mathematics, Providence, R.I. Apr 1955. 22p graphs. Order from LC. Mi $2.70, ph $4.80. PB 126155

The purpose of the work described in this paper was to provide information on the elastic and plastic deformation of steel beams subjected to transverse impact. The particular impact problem treated was chosen to correspond to conditions in tests in which a beam initially at rest is struck by a massive hammer, so that a specified change of velocity is imposed at a certain cross-section in a small time interval. Contract N7 onr-35801, T.O. 1, NR 041 406. GDAM/A 11-115. GDAM/TR 115.

Methods for calculating pressure distributions on oscillating wings of delta type at supersonic and transonic speeds, by F. Hjelte. Sweden. Kung. Tekniska Högskolan. Institutionen för Flygteknik, Stockholm. Mar 1956. 30p diagr, graphs. Order from LC. Mi $2.70, ph $4.80. PB 126151

This report contains the derivation and application of some approximative methods for calculating pressure distributions and aerodynamic forces on oscillating wings of delta type. The methods were derived for supersonic speeds, but are valid also for transonic speeds. Linearized theory has been used. The first method is an iterative one based on slender body theory and intended for small aspect ratio wings and low frequencies. The second method is an approximation for high frequencies. The two methods have been applied to some simple cases and compared with other methods. KTH AERO TN 39.

Part I: On laminar flow through a channel or tube with porous walls: Application of method of averages, by M. Morduchow. Part II: Further investigation of laminar flow in channels with porous walls, by S.W. Yuan. Polytechnic Institute of Brooklyn, Brooklyn, N.Y. Jun 1956. 15p graphs, table. Order from LC. Mi $2.40, ph $3.30. PB 127962

The purpose of this paper is to present a simple approximate closed-form solution for the flow through a channel and through a circular tube with porous walls valid for the entire range of normal fluid injection velocities from zero to indefinitely large. The method of analysis is based on the method of averages. Part I submitted to the Quarterly of Applied Mathematics for publication. 1956. For Part II see the Mar 1956 issue of Journal of Applied Physics, vol. 27, no. 3, pp 267-269. Contract N6 ori 105, T.O. III, NR 098-038. Project Squid. PB TR-28-P.

Pólya type distributions II, by Samuel Karlin. California Institute of Technology. Dept. of Mathematics, Pasadena, Calif. Oct 1955. 45p. Order from LC. Mi $3.30, ph $7.80. PB 124834

In Part I (PB 119525) a specific smoothing property characterizing a class of distributions which was called Pólya type (P.T.) distributions was introduced. Most of the standard distributions occurring in statistical practice are of Pólya type. For this class of distributions many of the usual decision theoretic questions were analyzed. This investigation is divided into three main parts. Part I describes some

new characterizations of P.T. distributions. Part II examines in detail many of the standard Neyman-Pearson concepts for the case when the underlying distributions are known to be Pólya type. Representative topics treated include the principle of unbiasedness, enveloped power functions, likelihood ratio tests, etc. A general minimax theorem for the two action decision problem is developed in Part III. For Part I see PB 119525. Contract Nonr-220(16), NR 042-995, Technical report no. 1.

Sampling inspection by variables with no calculations, by Herman Chernoff and Gerlald J. Leiberman. Stanford University. Applied Mathematics and Statistics Laboratory, Stanford, Calif. Apr 1955. 13p graphs, tables. Order from LC. Mi $2.40, ph $3.30. PB 126148

The purpose of this paper is to present a graphical procedure for sampling inspection by variables which involves no computations and which also gives a check on the assumption of normality. Contract Nonr-25126, NR 042-002. SU AMSL TR 22.

MEDICAL RESEARCH AND PRACTICE

Bacterial electrophoresis studies, by S.B. Crecelius and J.M. Leonard. U.S. Naval Research Laboratory. Dec 1957. 29p diagr, graphs (part fold), tables. Order from OTS. 75 cents. PB 131484

Electrophoretic mobility determinations have been made on five bacteria (B. globigii, S. marcescens, B. subtilis, E. coli, and B. cereus) in buffers of variable pH (3 to 7.4) and constant molarity. Curves of pH vs mobility were determined for each organism. Similar electrophoretic determinations were repeated on the same organisms treated with methylene blue and ultraviolet light. Samples of these same bacteria which had been freeze-dried were treated with propylene oxide and formaldehyde after which electrophoretic determinations were made. Infrared spectrum determinations were made on samples of the whole freeze-dried organisms, and on extracts thereof. These infrared spectra support in a general way the electrophoretic mobility data. NRL R 5070.

Hearing conservation data and procedures. Armed Forces - National Research Council. Committee on Hearing and Bio-Acoustics, St. Louis, Mo. Jun 1956. 18p table. Order from LC. Mi $2.40, ph $3.30. PB 126204

Instructions for the guidance of the technician in the use of the audiometric data card. Final report of working group no. 21. Contract Nonr 1151(01), NR 140-069, Technical report no. 7. CHABA MR 2.

Neurological mechanisms in epilepsy and in group behavior. Annual progress report for period 1 Jan 1955 to 1 Jan 1956 under Contract Nonr-609 (08), NR 113-320, by Jose M.R. Delgado. Yale University, New Haven, Conn. Jan 1956. 13p. Order from LC. Mi $2.40, ph $3.30. PB 124704

Objectives were: a) Study in awake animals of neurological mechanisms involved in the onset, spread and climical manifestations of epilepsy. b) Influence of cerebral stimulation on group behavior of animals recorded by time lapse photography. Contract Nonr-609(08), NR 113-320.

Oxygen poisoning. U.S. Air Force. School of Aviation Medicine, Randolph Field, Tex. Jun 1956. 35p graphs, tables. Order from LC. Mi $3.00, ph $6.30. PB 126045

Contents: Report no. 56-40. Effects of starvation and X-irradiation on oxygen poisoning in mice, by Rebeca Gerschman, Daniel L. Gilbert, Peter Dwyer and Wallace O. Fenn. - 56-41. Influence of high oxygen pressure on the vicosity of desoxyribonucleic acid and the formation of hydrogen peroxide, by Daniel L. Gilbert, Rebecca Gerschman, Jules Cohen, Wade W. Sherwood, L.K. Kim and Wallace O. Fenn. - 56-42. Effects of autonomic drugs on oxygen poisoning, by Rebeca Gerschman, Daniel L. Gilbert and Sylvanus W. Nye. - 56-43. Effects of cobaltous ion, glutathione, and thiourea on the survival times of mice submitted to high oxygen tensions, by Rebeca Gerschman, Daniel L. Gilbert, Sylvanus W. Nye and Wallace O. Fenn. -56-44. Role of the adrenal cortical hormones and of dibenzyline in normal and demedullated mice submitted to high oxygen pressure, by Rebeca Gerschman, Daniel L. Gilbert, Sylvanus W. Nye, William E. Price, Jr. and Wallace O. Fenn. AF SAM R 56-40-56-44.

Radiological dose to persons in the U.K. due to debris from nuclear test explosions prior to Jan 1956, by N.G. Stewart, R.N. Crooks and E.M.R. Fisher. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. 1957. 30p graphs, tables. Available from British Information Service, 30 Rockefeller Plaza, New York 20, N.Y. 82 cents. PB 124578s

Supplement to PB 124578. S.O. Code no. 91-3-2-81.
1. Dust, Radioactive - Analysis - Gt. Brit.
2. Radiation - Dosage determination - Gt. Brit.
3. AERE HP/R 2017, Amended

Study of adrenal function at high altitudes with the intravenous ACTH test, by Javier Correa, Ruth Aliaga and Federico Moncloa. U.S. Air Force. School of Aviation Medicine, Randolph Field, Tex. Sep 1956. 7p graphs, tables. Order from LC. Mi $1.80, ph $1.80. PB 126043

The suprarenal function was stimulated by means of intravenous administration of ACTH in two groups of subjects healthy men living at sea level and

healthy native residents in Morococha, at an altitude of 4,540 meters (14,900 feet). The response to this stimulation was determined by measuring the urinary excretion of 17-ketosteroids and 17-hydrocycorticoids and the fall in the circulating eosinophils. Well-defined differences were not found between the two groups. AF SAM R 56-101.

METALS AND METAL PRODUCTS

Arc-cast molybdenum base alloys, by M. Semchyshen and R.Q. Barr. Climax Molybdenum Co., Detroit, Mich. 1955. 435p photos, drawings, diagrs, graphs, tables. Order from LC. Mi $11.10, ph $63.30. PB 126447

Contents: Introduction. - Deoxidation and hot plasticity. - Cast molybdenum and molybdenum-base alloys. - Mechanical properties of wrought alloys. - Effect of variation in strain hardening on mechanical properties and recrystallization temperature. - Embrittlement resulting from exposure to elevated temperatures. - Coatings for protection of molybdenum against oxidation. - Appendix A: Procedures for chemical analysis of molybdenum-base alloys. - Appendix B: Metallographic techniques for molybdenum-base alloys. - Appendix C: Hot hardness of molybdenum and molybdenum-base alloys as cast. - Appendix D: Mechanical properties of wrought molybdenum and molybdenum-base alloys. Contract N8 onr-78700, NR 039-002, Summary report.

Cohesive energy of noble metals, by K. Kambe. Harvard University. Cruft Laboratory, Cambridge, Mass. Apr 1955. 12p tables. Order from LC. Mi $2.40, ph $3.30. PB 126153

The method, developed by Kuhn and Van Vleck, and later simplified and extended by Brooks, for calculating the cohesive energy of monovalent metals, is here further extended to include the effects of the deviation of the effective ion core potential from pure hydrogenic form in the vicinity of the surface of the s-sphere. The cohesive energies calculated at the observed lattice spacings with the rigid ion-core assumption are 61.7 for Cu, 55.8 for Ag, and 49.2 for Au in comparison with the experimental values of 81.2, 68.0, and 92.0 respectively. Here the energy unit is K cal/mole. Contract N5-ori-76, T.O. 1, NR 372-012. HU CL TR 227.

Creep properties of metals under intermittent stressing and heating conditions. Part 3: Combined intermittent stressing and heating, by Lawrence A. Shepard, C. Dean Starr, Carl D. Wiseman and John E. Dorn. California. University. Institute of Engineering Research, Berkeley, Calif. Jul 1954. 25p graphs, tables. Order from LC. Mi $2.70, ph $4.80. PB 130204

Tests on the combined effect of intermittent loading and intermittent heating on the creep strength of aluminum alloy 75S-T6 at 450°F were performed. Within the limits of scatter, simultaneous cycling of the load and temperature in phase produced little effect other than to extend the creep test by the time periods at room temperature and no load. For parts 2, 4, and 5 see PB 131016, 121435 and 121476. Contract AF 33(038)-11502. AF WADC TR 53-336, Part 3.

Development of titanium-base alloys. Battelle Memorial Institute, Columbus, O. Jun 1952. 214p photos, graphs, tables. Order from LC. Mi $9.60, ph $33.30. PB 126910

The experimental work consisted of melting and testing of exploratory alloys. Past work indicated that the addition of the beta stabilizing elements such as chromium, iron, manganese, molybdenum, and vanadium, offered the best possibility in the development of titanium alloys. This observation was verified when ternary and complex alloys containing these elements were tested and found to posses desirable properties. A number of exploratory alloys were heat treated and tested to determine the general effects of different thermal cycles on tensile properties. The effects of quenching media and low temperature aging were also investigated. As a result of the studies on the binary type alloys such as Ti-Cr and Ti-Mn containing from 5 to 8% of the alloying element, the hypothesis was proposed that the beta phase is susceptible to a hardening phenomenon involving a submicroscopic precipitation of the alpha phase. Recrystallization, isothermal-transformation studies, and welding experiments were conducted using binary To-Cr alloys. Ductile welds in the "as-welded" condition were obtained in these high strength alloys. AD 6453. Covers period 19 May 1951 - 18 May 1952. Contract AF 33(038)-3736. AF WADC TR 52-249.

Effect of fatigue crack on static strength: 2014-T6, 2024-T4, 6061-T6, 7075-T6 open-hole monobloc specimens, by Glenn E. Nordmark and Ian D. Eaton. Aluminum Company of America. May 1957. 22p photo, drawing, graphs, tables. Order as TM 1428 from National Advisory Committee for Aeronautics, 1512 "H" Street, N.W., Washington 25, D.C. PB 126099

Static tensile test results are presented for specimens of 2014-T6, 2024-T4, 6061-T6, and 7075-T6 aluminum alloy containing fatigue cracks. The results indicate that the presence of a fatigue crack reduced the static strength, in all cases, by an amount larger than the corresponding reduction in net area. It is indicated that a 7075-T6 specimen may develop as little as one-third of the expected static tensile strength when the fatigue crack has consumed only one-fourth of the original area. NACA TM 1428.

Effect of various machining processes on the reversed-bending fatigue strength of A-110 AT titanium

alloy sheet, by Robert J. Rooney. U.S. Air Force. Air Research and Development Command. Wright Air Development Center. Materials Laboratory, Wright-Patterson Air Force Base, Dayton, O. Nov 1957. 14p drawings, graphs. Order from OTS. 50 cents.
PB 131606

The results of reversed cantilever bending fatigue tests on A-110 AT(5% Al - 2.5% Sn) titanium alloy sheet, machined by various processes, are presented. The machining processes employed were the following: Ultrasonic, slab milling, chem-milling, grinding and electrical discharge machining. The effect of shot-peening on the fatigue strength of the "as-rolled" alloy is also presented. The effects of the various machining processes, as well as that of shot-peening, are shown by comparing the fatigue strengths obtained under these conditions with the fatigue strength of the material in the "as-rolled" condition. Results of the measurements of residual surface stress in the "as-rolled" material are also presented. AD 142118. Project no. 7360. AF WADC TR 57-310.

Investigation in the zone theory of the energy of electrons in metals, by George B. Spence and Ernst Katz. Michigan. University. Engineering Research Institute, Ann Arbor, Mich. Aug 1956. 122p photos, diagrs, graphs, tables. Order from LC. Mi $6.30, ph $19.80.
PB 125898

This work is a theoretical investigation of certain general problems which occur in using the zone theory of the electron energy bands to determine the phase boundaries of those alloys agreeing with the Hume-Rothery electron concentration rules. Project no. R-355-40-10. Also submitted as a Thesis, University of Michigan. Appendix A: - Some Brillouin zones of the cubic lattices. - Appendix B: - Whittaker - Ince solution of Hill's equation. - Appendix C: - Analysis of several Jones zones. Contract AF 18(600)-750. MU ERI Proj 2158-7-T.

Isothermal transformation of austenite under externally applied tensile stress, by Subrata Bhattacharyya and George L. Kehl. Columbia University. School of Mines, New York, N.Y. Oct 1955. 102p graphs (part fold), tables. Order from LC. Mi $5.70, ph $16.80. PB 130191

The influence of externally applied tensile stress on the isothermal decomposition of austenite to pearlite in AISI 1085 steel at 1273° and 1253°F, and to ferrite and pearlite in AISI10B45 steel at 1253°F (austenitized at 1630° and 1875°F), has been investigated. It was found that applied stress markedly affected both the beginning and ending times of transformation, and accelerated the rate of transformation. Final report on Contract Nonr-266(18), Task no. NR 031-456. Part I is preprint of a paper presented at the 36th annual convention of the American Society for Metals, Chicago, Nov 1-5, 1954. Contract Nonr-266(18), NR 031-456, Final report.

Mechanical properties of 90-10 copper-nickel alloys, by R.B. Niederberger. U.S. Naval Engineering Experiment Station, Annapolis, Md. Jun 1952. 19p drawings, graphs, tables. Order from LC. Mi $2.40, ph $3.30. PB 127911

This investigation was made to determine the mechanical properties of the 90-10 alloy in rod and plate form for specification purposes. Tension and bend tests, flexural and torsional fatigue tests, and tension tests at temperatures up to 800°F were conducted. NS 013-118. NAV EES 4E(B-1) 101717.

Mechanism of phase transformations in metals, by David S. Lieberman. Illinois. University. Dept. of Mining and Metallurgical Engineering, Urbana, Ill. Mar 1956. 12p diagrs, graphs. Order from LC. Mi $2.40, ph $3.30.
PB 126294

AD 96221. MED UI-17-AF. Discussion presented at the Symposium on the mechanism of phase transformations in metals, sponsored by the Institute of Metals at the Royal Institution, London, 9 Nov 1955. 1. Phase transitions - Theory 2. Metals - Transformation 3. Contract AF 18(600)-1311 4. AF OSR TN 56-412

Partition of soluble carbon in Ti-6Al-4V alloy, by Richard D. Siebel, Richard L. Beck and Leonard E. Olds. Denver. University. Denver Research Institute, Denver, Colo. Nov 1957. 78p photos, drawings, graphs, tables. Order from OTS. $2.00. PB 131603

This report describes the results of an investigation of possible means for determining the micro-distribution of interstitial-type solutes such as nitrogen, oxygen and carbon, particularly in the more complex alloys. A useful method was developed for measuring micro-distribution of solutes in alloys. AD 142137. Project no. 7351, Task 73510. Covers period 1 Feb 1956 to 28 Feb 1957 under Contract AF 33(616)-3349. AF WADC TR 57-269.

Phase relationships in magnesium alloys, by J.J. Park and L.L. Wyman. U.S. National Bureau of Standards. Oct 1957. 33p photos, diagrs, graphs, tables. Order from OTS. $1.00.
PB 131622

A study of phase relationships in selected magnesium-base alloys has been completed using thermal, X-ray, and metallographic methods. The magnesium-rich portions of the binary phase diagrams of magnesium plus certain rare earth metals (lanthanum, cerium, praseodymium and neodymium) have been determined. A thorough investigation of the magnesium-zinc system from 0 to more than 66.67 a/o zinc was also conducted and the presence of four intermediate phases with their stability ranges has been established. In addition, the extent of the solid solubility of zinc in magnesium was determined. AD 142110. Project no. 7021, Task

no. 70662. Covers period Dec 1954 to Aug 1957 under Contract AF 33(616)-55-4. AF WADC TR 57-504.

Research on heat resistant alloys strengthened at elevated temperatures by incorporation of fine particulate substances. Interim report no. 1, 17 Nov 1955 through 16 Jan 1956, under Contract NOas 56-227-C, by Martin Epner and Claus G. Goetzel. Sintercast Corporation of America, Yonkers, N.Y. Feb 1956. 12p photos, diagr. Order from LC. Mi $2.40, ph $3.30.
PB 129242

In a development program for reinforced metal products based on heat resistant alloys, ultrafine particulate substances are to be incorporated into a ductile matrix in such a distribution as to give optimum inhibition to creep and slip at elevated temperatures. Experiments have been initiated and apparatus procured to employ fine Nichrome and titanium carbide powders as starting materials in the powder metallurgy manufacture of the reinforced metal product.

Research on the effects of stress, strain, and temperature on the eutectoid decomposition of titanium alloys, by Adolph W. Goldstein, Arthur G. Metcalfe and William Rostoker. Armour Research Foundation, Chicago, Ill. Nov 1957. 72p photos, drawings, graphs, tables. Order from OTS. $2.00. PB 131610

Three titanium-chromium alloys have been forged in the α-β range to give six systems with controlled amounts of each phase. The isothermal transformation at 400°, 500°, and 600°C of each of these systems was followed by resistivity, X-ray diffraction, elastic modulus measurements, and metallography. The reactions occurring in the transformation were identified where possible. This transformation study was repeated under a stress which produced 1% creep in 1000 hours. An acceleration of four to seven times in the rate of transformation occurred under the action of this stress. Complete tensile test data were obtained at all stages of the transformation and plotted on the T-T-T diagrams. These reveal that the formations of Omega and $TiCr_2$ are the embrittling reactions. AD 142142. Project no. 7351. Covers work 1 Feb 1956-30 May 1957 under Contract AF 33(616)-3394. AF WADC TR 57-360.

Strength of an alloy containing zones, by A. Kell and M.E. Fine. Northwestern University. Dept. of Metallurgy, Evanston, Ill. Dec 1956. 10p. Order from LC. Mi $1.80, ph $1.80.
PB 124768

Rough estimates are made of the stress necessary to force dislocation through a Guinier-Preston zone in an aluminum alloy containing 2 atomic % copper and in an aluminum alloy containing 13 atomic % silver. The values found are significantly less than those calculated using a model for the strength of a precipitation hardened alloy proposed by Orowan. It is suggested that the process of shearing the zones determines the initial flow stress in these age-hardening alloys. AD 115005. Contract AF 18(600)-1468. AF OSR TN 56-581.

Thermische aluminiumherstellung (Thermal aluminum production) by F.G. Schytil. Metallgesellschaft A.G., Frankfurt A.M. Chemisches Laboratorium. Order separate parts described below from LC, giving PB number of each part ordered.

I. Dampfdruck des aluminiums. (Vapor pressure of aluminum). Feb 1941. 10p diagrs, graph, tables. Mi $1.80, ph $1.80.
PB 126171

I. The boiling point of aluminum at atmospheric pressure is 1762°C. and the heat vaporization is 46,500 calories. BIOS HEC 12214. Micro BIOS FD 5059/47.

II. Dampfdruck von siliciummonoxyd. (Vapor pressure of silicon monoxide). Mar 1941. 14p photos, graphs, table. Mi $2.40, ph $3.30. PB 126170

The boiling point of silicon monoxide at atmospheric pressure is 1568°C. and the heat of vaporization is 95,960 calories. BIOS HEC 12220. Micro BIOS FD 5059/47.

Vaporization of compounds and alloys at high temperature, by Richard E. Honig and Jean Drowart. Free University of Belgium, Brussels, Belgium. Oct 1956. 37p drawing, diagrs, tables. Order from LC. Mi $3.00, ph $6.30. PB 125892

In rate-of-vaporization experiments, elements of Group IB (Cu, Ag, and Au) and of Group IIIB (Ga and In) have been investigated in a 60° mass spectrometer. The instrument was modified to permit the vaporization of milligram samples from small, electrically heated crucibles made of suitable materials such as C, Mo, Al_2O_3, and BeO. For Cu, Ag, and Au there were found not only the expected atomic species, but also small concentrations of the dimers. The absolute entropy method has been used to obtain the dissociation energies of the Group IVB molecules C_2, Si_2, Ge_2, Sn, and Pb_2, based on data from previous studies. AD 110-374. Technical note 1. Contract AF 61(514)-868. AF CRC TN 56-555.

METEOROLOGY AND CLIMATOLOGY

Bases for statistical forecasts of the fall temperature conditions at Buenos Aires. (Bases para el

pronóstico a medio plazo de las condiciones de temperatura en el otoño de Buenos Aires), by Werner Schwerdtfeger. Translated by Valda Dreimanis and David Kraus. Feb 1956. 22p graph, tables. Order from LC. Mi $2.70, ph $4.80. PB 124828

This article is a first attempt in considering statistical methods based on synoptic considerations by the use of tables showing the frequencies of multiple correlations. Translated for Geophysics Research Directorate, AF Cambridge Research Center, Cambridge, Mass., under Contract AF 19(604)-1364, by The American Meteorological Society, from Meteoros, 1(1)-p. 35-45, 1951.

Infrared spectroscopy of the sun, moon and earth, by Arthur Adel. Arizona State College. Atmospheric Research Observatory, Flagstaff, Ariz. Mar 1957. 70p. Order from LC. Mi $3.90, ph $10.80. PB 126094

AD 117148. Progress report no. 28. Covers period 10 Mar 1950 - 10 Mar 1957. For another report under this Contract see PB 120282. 1. Spectroscopy, Infrared - Sources 2. Solar radiation - Spectrography 3. Nitrogen oxides - Atmospheric distribution 4. Atmosphere - Spectrographic analysis 5. Contract AF 19(122)-198, Final report 6. AF CRC TR 57-258

Middle - latitude precipitation patterns as observed by radar (a collection of composite radarscope observations), by Myron G.H. Ligda and others. Texas. Agricultural and Mechanical College. Dept. of Oceanography and Meteorology, College Station, Tex. Jan 1957. 144p photos, table. Order from LC. Mi $7.20, ph $22.80. PB 126664

Composite radarscope photographs, at one hour intervals, are presented for a number of storm systems. Corresponding standard surface map analyses are given for every third hour. A brief discussion of each case is included. AD 110255. A & M project 131 - Reference 57-4T. Contract AF 19(604)-1564, Scientific report no. 1. AF CRC TN 56-886.

Objective prediction of 24 hour tropical cyclone movement. U.S. Chief of Naval Operations. May 1956. 39p maps, diagrs, graph, tables. Order from LC. Mi $3.00, ph $6.30. PB 129832

Includes change no. 1, dated Sep 1956. 1. Cyclones, Tropical - Forecasting 2. Hurricanes, Tropical - Forecasting 3. NAVAER 50-1P-542

On cold metastable high-pressure areas (Ueber kalte metastabile hochdruckgebiete), by Herman Flohn. Translated by James Gough, Jr. Feb 1956. 45p diagrs, tables. Order from LC. Mi $3.30, ph $7.80. PB 124827

Nearly stationary high-pressure areas composed of cold tropospheric air are investigated in a comparative study of eighteen separate cases lasting from 5 to 17 days. The occurrence of cold high-pressure areas in Canada, Russia, and Eastern Siberia as well as in the Antarctic is investigated on the basis of the available aerological-climatic data of upper wind measurements and surroundings. The present investigation is planned as the first of a series of papers to emanate from the Central Office of the Weather Bureau in Bad Kissingen (U.S. Zone). Translated for Geophysics Research Directorate, AF Cambridge Research Center, under Contract AF 19(604)-1364, by The American Meteorological Society from Meteorologische Rundschau, 2(3/4): p. 67-75, 1949.

On the synoptic use of a finite-amplitude wave equation, by Leon Sherman. Florida State University. Dept. of Meteorology, Tallahassee, Fla. Jan 1956. 103p diagr, graph, tables. Order from LC. Mi $5.70, ph $16.80. PB 124706

In this report computation sheets have been prepared for the determination of the longitudinal speeds of propagation for disturbances of various classes of wave length, starting from the NWAC teletype data. At least upon theoretical grounds, it seems possible that these should lead to an improvement over the simple Rossby equation computations. Contract Nonr-1600(00), NR 082-071, Technical report no. 4.

Procedure for numerical intergration of the primitive equations of the two-parameter model of the atmosphere, by Arnt Eliassen. California. University. Dept. of Meteorology, Los Angeles, Calif. Mar 1956. 54p diagr, table. Order from LC. Mi $3.60, ph $9.30. PB 124838

For Scientific reports 1-3 under this Contract see PB 120145, 120153 and 122379. 1. Weather forecasting - Mathematical analysis 2. Models, Meteorological - Mathematical analysis 3. Contract AF 19(604)-1286, Scientific report no. 4

Results of simultaneous recordings of atmospheric electric parameters at six levels between 700 and 3000 m above sea level (Ergebnisse synchroner registrierungen luftelektrischer elemente in sechs niveaus zwischen 700 und 3000m seehöhe), by Reinhold Reiter. Translated by Rudolf Loeser. Jun 1956. 13p diagr, graphs, table. Order from LC. Mi $2.40, ph $3.30. PB 124826

This report contains the results of simultaneous synoptic recordings of atmospheric-electric parameters at six altitude levels between 700 and 3000 meters above sea level. These investigations serve

to clarify the electrical processes and conditions in the lower atmosphere; special emphasis is placed here on the investigation of the charge distribution in the different cloud formation, on the charge of precipitation, and on the electrical conditions in fog. Translated for the Geophysics Research Directorate, A.F. Cambridge Research Center, under Contract AF 19(604)-1364, by The American Meteorological Society from Zeitschrift für Meteorologie, 9(4): p. 116-120, 1955. Contract AF (514)-732-C.

Snow characteristics project. Final progress report under Contract DA-11-190-Eng-3, by R.V. Dunkle and J.T. Gier. California. University. Institute of Engineering Research, Berkeley, Calif. Aug 1955. 123p photos, drawings, diagrs, graphs, tables. Order from LC. Mi $6.30, ph $19.80. PB 127922

The research program was established to investigate from a fundamental viewpoint, the thermal radiation characteristics of materials used in or indigenous to the arctic regions. The research program as initiated, was directed toward these objectives. The facilities that were immediately available such as the heated cavity reflectometer, and which were adaptable to the program were placed into use as soon as practicable. During and following this phase, attention was directed toward development of new devices and instruments to perform measurements not possible with existing facilities. This portion of the program developed the Snow Emissivity Meter, and Solarimeter and the beginnings of the Paraboloid Reflectometer. Spectral reflectance measurements were obtained with the heated cavity reflectometer for paints, coatings and minerals. Covers period Jun 24, 1953 -Aug31, 1955. UC IER Series 62, Issue no. 5.

Stellar scintillation and its relation to atmospheric turbulence, by Geoffrey Keller. Ohio State Research Foundation, Columbus, O. Jan 1956. 23p graphs, table. Order from LC. Mi $2.70, ph $4.80. PB 126156

1. Stars - Scintillation - Theory 2. Atmosphere - Turbulence - Theory 3. Fourier analysis 4. Contract AF 19(604)-1409 5. OSURF Project 635, Scientific report no. 1 6. AF CRC TN 56-363

Studies in weather analysis and forecasting. Final report under Contract AF 19(604)-1293 for the period 25 Nov 1954 to 24 Feb 1957, edited by Sverre Petterssen. Chicago. University. Dept. of Meteorology, Chicago, Ill. Feb 1957. 456p maps, graphs, tables. Order from LC. Mi $11.10, ph $69.60. PB 126368

Contents: A review and summary of recent forecasting research, by S. Petterssen. - On verification of prognostic charts, by S. Petterssen. - A prediction model for cyclone development integrated by Fjørtoft's method, by M.A. Estoque. - Graphical integration of a two-level model, by M.A. Estoque. - An experiment in graphical forecasting based on two baroclinic models, by D.W. Saxton. - An experiment in forecasting the displacement of troughs and ridges, by Staff Members, Weather Forecasting Research Center. - An experiment in prognostication, by S. Petterssen, M.A. Estoque and Lawrence A. Hughes. - An experiment in stability and moisture analyses, by D.L. Bradbury. - Moisture analysis and water budget in different types of storms, by D.L. Bradbury. - An approach to quantitative precipitation forecasting, by M.A. Estoque. - On the distribution of errors in prognostic charts, by S. Petterssen. - A graphical prediction model with orographic influences, by M.A. Estoque. - Mechanisms of circulation changes during a Lee cyclogenesis, by C.W. Newton. - Hurricane Hazel and a long-wave outlook, by Lawrence A. Hughes, Ferdinand Baer, Gene E. Birchfield and Robert E. Kaylor. - Vertical circulation and release of kinetic energy during the development of hurricane Hazel into an extratropical storm, by Erik Palmén. - On the mechanism of vorticity changes associated with a selected cyclone, by M.A. Estoque. - On the behavior pattern of cyclones and anticyclones as related to the zonal index, by D.L. Bradbury. AD 117159. AF CRC TR 57-263.

Water balance, by C.W. Thornthwaite and J.R. Mather. Drexel Institute of Technology. Laboratory of Climatology, Centerton, N.J. Jan 1956. 111p maps, graphs, tables. Order from LC. Mi $6.00, ph $18.30. PB 129690

The first part of the report includes a discussion of the problems and limitations which are involved in any attempts to measure evapotranspiration experimentally or to compute it from available climatic data. Having shown that instruments such as the Piche, Class A water pan, or lysimeters do not provide adequate measures of potential evapotranspiration, there is an effort to list the necessary conditions under which this important climatic factor can be measured directly. The report then describes the modifications which have been developed to provide more realistic results from the use of the water balance bookkeeping procedure. The second part of the report is devoted to a discussion of the application of the various factors of the water balance in different lines of research. The report concludes with a bibliography of articles dealing with potential evapotranspiration and the water balance which have been published by scientists in all parts of the world. An appendix provides the detailed instructions, tables, and nomograms which are necessary to permit the easy evaluation of the new water balance on either a daily or monthly basis. Publications in climatology, vol. VIII, no. 1. Contract AF 19(604)-1306, Scientific report no. 1. Contract Nonr-1617(00), NR 389-101, Technical report no. 1.

MINERALS AND MINERAL PRODUCTS

Cold-cured piezoelectric ceramics, by A.D. Burbage and M.J. Riley. U.S. Naval Research Laboratory. Feb 1958. 7p tables. Order from OTS. 50 cents. PB 131523

A new procedure for the preparation of cold-cured piezoelectric ceramic bodies has been developed using commercial grade barium titanate powder with liquid sodium silicate or carnauba wax as binders. By this method, elaborate firing and polarization procedures are eliminated; both firing and polarization may be accomplished in one simple operation. The bodies produced by this preparation have piezoelectric properties which can be used with commercial equipment for detecting sound and mechanical vibration. NRL R 5089.

Deformation of rocks and minerals at high pressures and temperatures. Final report for period 1 Jun 1949 - 30 Jun 1955, under Contract N6 onr-27511, NR 081-101, by D.T. Griggs. California. University. Institute of Geophysics, Los Angeles, Calif. Jun 1955. 8p graph. Order from LC. Mi $1.80, ph $1.80. PB 125894

A summary of experimental work done between June 1, 1949 and June 30, 1955 on the deformation of marble, calcite, granite, basalt, and dolomite at pressures up to 100,000 bars and temperatures to 600°C. Includes list of publications under this contract. Contract N6onr-27511, NR 081-101, Final report.

Reconnaissance of the ceramic and refractory clays of Western Australia, by R.W. Cox, A.C. Frostick, W.G. Garrett and W.O. Williamson. Australia. Commonwealth Scientific and Industrial Research Organization. Division of Industrial Chemistry, Melbourne, Australia. 1956. 92p tables. Order from LC. Mi $5.40, ph $15.30. PB 126208

Division of Industrial Chemistry. Technical paper no. 2. 1. Clay minerals - Australia 2. Ceramic materials - Refractory properties - Australia

Temperature curve of the loss angle and dielectric constant of solid insulating materials in the range around 4000 megacycles (Temperaturgang des verlustwinkels und der dielektrizitätskontante fester isolierstoffe im bereich um 4000 MH_Z), by F. Gross. Translated and edited by F.A. Raven. Aug 1956. 17p diagr, graphs, tables. Order from LC. Mi $2.40, ph $3.30. PB 124803

The temperature dependency of the dielectric constant ε_r and the loss factor $\tan\delta$ of various important ceramic materials, glass, and plastics, used in the manufacture of electronic valves and high-frequency equipment, is investigated in the temperature range from 20°C to 350°C at frequencies of approximately 4000 Mc/sec by means of an E_{010}-mode resonator. Translated from Report of the Wernerwerk fur Bauelemente of the Siemens & Halske Corp. in NTZ (Nachrichtentechnische Zeitung), Vol. 9, no. 3, Mar 1956, p. 124-128. Table 3, referred to on p. 12, not included in report. NAVSHIPS T 618. STS 245.

ORDNANCE AND ACCESSORIES

Interior ballistics of the 3-in. gun fired at David W. Taylor model basin with a critical examination of certain assumptions of the Hirschfelder system of interior ballistics, by R.E. Johnson, J.W. Wrench, Jr., O. Kracek and K.F. Herzfeld. Catholic University of America, Washington, D.C. Nov 1945. 53p graphs, tables. Order from LC. Mi $3.60, ph $9.30. PB 126998

An attempt has been made to study critically some of the assumptions of the Hirschfelder system of interior ballistics, and to draw conclusions concerning interior ballistics from the firings of the 3-in. gun at Carderock, Md. Some of the conclusions are as follows: The pressure distribution along the gun and the average temperature are very similar for the case of constant density and for the Kent solution, if the pressure on the base of the projectile is given. From the amount of powder burnt one finds, assuming that the burning of each powder grain proceeds in layers parallel to the original surface of the grain, that the burning rate is approximately a linear function with intercerpt of the space average gas pressure. Unclassified 4 Sep 1953. Part of the final report under Contract OEM-sr-516. NDRC A-444. OSRD 6515.

Investigation of the propagation of blast waves over relatively large distances and the damaging possibilities of such propagation, by Warren W. Berning. U.S. Aberdeen Proving Ground. Ballistic Research Laboratories, Aberdeen, Md. Nov 1948. 48p graphs. Order from LC. Mi $3.30, ph $7.80. PB 126757

An attempt is made to determine those meteorological conditions which are conducive to unusual blast wave propagation and to establish a few rules of thumb which will enable a reasoning person, with the aid of temperature and wind soundings of the lower atmosphere, to determine the presence of dangerous propagating conditions. Project TB 3-0112J (TM 2-9105, 5008). APG BRL R 675.

Measurements of ionization and electron densities in the detonation wave of solid explosives, by R.T. Keyes, L.D. Lee and M.A. Cook. Utah.

University. Institute for the Study of Rate Processes. Explosives Research Group, Salt Lake City, Utah. Sep 1956. 40p diagrs, graphs, tables. Order from LC. Mi $3.00, ph $6.30. PB 125545

Electrical conduction measurements were made in the detonation wave of the loose explosives TNT (coarse and fine), RDX, PETN, tetryl, EDNA, 80/20 AN (ammonium nitrate)- TNT, and in the cast explosives TNT and Composition B. The measured conductivities were found to be of the same order of magnitude as those found in good semi-conductors. The electrical conductivities were used to calculate electron densities within the detonation wave, and these were found to be of the order of 10^{17} $1/cm^3$ in the ionization region for the explosives tested. Rather good agreement was obtained with one of the published theories of reaction zone length (the "geometrical model"). Contract AF 18 (603)-100, Technical report no. I. AF OSR TN 57-85.

PERSONNEL APTITUDE TESTING

Development and characteristics of the USAF officer activity inventory, by Michael A. Zaccaria, Ernest C. Tupes and Harry G. Lawrence. U.S. Air Force. Air Research and Development Command. Air Force Personnel and Training Research Center. Personnel Research Laboratory, Lackland Air Force Base, San Antonio, Tex. Jan 1957. 27p tables. Order from LC. Mi $2.70, ph $4.80. PB 126205

This report describes the development of an activity interest inventory as a first step toward bringing the area of interest testing to the level of aptitude testing, and presents reliability and preliminary validity data for the inventory. AD 098927. Project no. 7701, Task no. 77047. AF PTRC TN 57-15.

Effect of the differential selection of target study cues upon aiming point identification test performance, by G. Raymond Stone. U.S. Air Force. Air Research and Development Command. Air Force Personnel and Training Research Center. Aircraft Observer Research Laboratory, Mather Air Force Base, Calif. Feb 1956. 13p diagr, tables. Order from LC. Mi $2.40, ph $3.30. PB 124818

The design of the study tests the proposition that the quality of observer performance on a simulated bomb run will be a direct function of the differential selection of usable information from target study. Experienced aircraft observers were exposed to target study on the bomb run which is used in the Radar Aiming Point Identification Motion Picture Group Test, and then took the test. Following the test they were asked to report which of the target study cues they used as primary guides in locating the aiming point during the motion picture test. Project 7711. AF PTRC TN 56-40.

PHOTOGRAPHIC AND OPTICAL GOODS

Application of multiple-source schlieren systems, by E. Behun. United Aircraft Corporation. Research Dept., East Hartford, Conn. Nov 1957. 49p photos, drawings, tables. Order from LC. Mi $3.30, ph $7.80. PB 126271

Three applications of the multiple-source schlieren technique are investigated analytically and experimentally. Consideration is given to (1) large perforated wall transonic wind tunnels requiring mirror optics, (2) color rendition of flow disturbances in perforated wall transonic tunnels, and (3) exploitation of the sharp-focusing property of the multiple-source schlieren system for application to wind tunnels having transparent side walls. AD 115408. UAC R-0885-13. Air Force Project no. 7925. Contract AF 18(600)-1445. AF AEDC TR 57-19.

Cold weather photography. U.S. Naval Photographic Center, Anacostia, D.C. Dec 1955. 134p photos, graphs, tables. Order from LC. Mi $6.90, ph $21.30. PB 129788

1. Photographic equipment - Low temperature effects 2. Photographic processing machines - Low temperature effects 3. NAVAER 10-1-752

Photoelastic study of strain waves caused by cavitation, by George W. Sutton. California Institute of Technology. Hydrodynamics Laboratory, Pasadena, Calif. Oct 1955. 31p photos, graphs. Order from LC. Mi $3.00, ph $6.30. PB 124823

Ultra-high-speed photoelastic techniques have been applied to a study of the transient stresses and strains in a photoelastic plastic when subject to cavitation. A photocell, used to detect the transient strains, indicated that the time duration of the strains was about 2 microseconds. Using an ultra-high-speed motion picture camera, ultrasonic cavitation bubbles have been photographed collapsing on the surface of a photoelastic specimen, and the resulting strain wave in the solid has been photographed. The photoelastic plastic, CR-39, was found to exhibit strain birefringence, and its strain-optic constant was found to be independent of the rate of loading. Contract N6 onr-24420, NR 062-059. CIT HL 21-21.

PHYSICS

General

Boundary conditions in nonsteady flow, by George Rudinger. Cornell Aeronautical Laboratory, Inc., Buffalo, N.Y. Aug 1956. 18p photos, graphs. Order from LC. Mi $2.40, ph $3.30. PB 127955

Problems involving quasi-one-dimensional nonsteady flow in a duct require the knowledge of the conditions that govern the reflection of pressure waves from various flow boundaries. Some of these boundary conditions are accurately known while others must be treated by means of suitable assumptions. A brief review of the present knowledge in this field is presented. Based on previous investigations of shock reflections from an open end, improved boundary conditions were derived which account for the effect of the flow history. The results indicate that the actual flow conditions in the reflected wave lag somewhat behind those computed on the basis of the study-flow boundary conditions. This lag is small but may occasionally become significant. It was also found that certain discontinuities of an incident wave do not appear in the reflected wave. Comparison of the results with experimental data obtained by means of a shock tube are presented. To be presented at the 9th International Congress of Applied Mechanics under the auspices of the International Union of Mechanics, Brussels, Belgium, Sep 5-13, 1956. Abstracts in English and French. Contract N6 ori-105, T.O. III, NR 098-038. Project Squid. CAL TR 69-P.

Correlation of maximum heat flux data for boiling of saturated liquids, by Warren M. Rohsenow and Peter Griffith. Massachusetts Institute of Technology. Division of Industrial Cooperation, Cambridge, Mass. Mar 1955. 7p graph. Order from LC. Mi $1.80, ph $1.80. PB 126207

AD 70104. DIC project no. 6627. 1. Boiling - Heat transfer 2. Liquids - Heat transference 3. Heat - Transference - Theory 4. Contract N5 ori-07827, NR 035-267, Technical report no. 6

Heat transfer in chemically reacting gas mixtures, by Joseph O. Hirschfelder. Wisconsin. University. Naval Research Laboratory. Dept. of Chemistry, Madison, Wis. Feb 1956. 29p diagrs, graphs, tables. Order from LC. Mi $2.70, ph $4.80. PB 126440

If a chemically reacting gas mixture is confined between two parallel plates, one hot and the other cold, the temperature and the chemical composition at a point as well as the overall heat flux depend upon the rates of both the homogeneous reactions in the gas phase and the heterogeneous reactions on the surfaces. Detailed examples are given. Contract N7 onr-28511. WIS ONR-18.

Heat transfer to boiling liquid under conditions of high temperature difference and forced convection, by O.P. Bergelin and S. Rankin. Delaware University. Dept. of Chemical Engineering, Newark, Del. Jun 1956. 26p photos, diagr, graphs. Order from LC. Mi $2.70, ph $4.80. PB 126722

A critical review of the research project is presented including a statement of its original objectives, later modifications to these objectives, the progress thus far, and a proposed schedule for work. Interim technical report UD FB 7. DA Project 5B-99-01-004. Ord. Project TB 2-0001. OOR Project no. 1366. Contract DA 36-034-ORD-1797.

Investigation of the factors affecting the attachment of a liquid film to a solid surface, by C.F. Warner and B.A. Reese. Purdue University, Lafayette, Ind. Jun 1956. 29p photos, diagrs, graphs, tables. Order from LC. Mi $2.70, ph $4.80. PB 127961

The purpose of this paper is to summarize the results of the experimental investigation on the film attachment phase of the film flow study and to present an empirical equation based on momentum exchange that correlates the results of the investigation with two and three dimensional flow fields. The paper is divided into six sections: I. The effect of the physical dimensions on the critical velocity of injection. II. The effect of physical properties of the liquid on the critical velocity of injection. III. The effect of gas properties on the critical velocity of injection. IV. Correlation studies. V. Visual studies of liquid film. VI. Conclusions. Presented at the American Rocket Society Fall Meeting, Buffalo, N.Y., Sep 24-26, 1956. Project Squid. Contract N6 ori 105, T.O. III, NR 098-038. PUR - 28- P.

Measurement of gas temperature, by Max Carbon, R.J. Albert and G.A. Hawkins. Purdue University. Purdue Research Foundation, Lafayette, Ind. Contract N6 ori-104, T.O. I. Order separate parts described below from LC, giving PB number of each part ordered.

Part I. May 1947. 22p graphs (part fold). Mi $2.70, ph $4.80. PB 126284

The report covers the following topics: 1. The measurement of gas temperatures for high velocity flow. 2. Brief abstracts of articles available at Purdue University on the measurement of gas temperatures for high velocity flow. 3. List of technical references which refer to the general subject of gas temperature measurement. PUR-2-M.

Part II. Jul 1947. 29p photos, drawings, diagrs. Mi $2.70, ph $4.80. PB 126283

The subject discussed herein is the design and construction of apparatus capable of detecting, amplifying, and recording the voltage generated by a thermocouple that is in contact with a gas, the temperature of which fluctuates rapidly. A schematic diagram of the apparatus is shown. PUR-1-M.

Method for dynamically measuring wall deformations and collapsing strengths of plastic cylinders under external hydrostatic pressure. (NOL-2-Re3e-520-2), by F. Robert Barnet, G.L. Beyer Jr. and J.C. New. U.S. Naval Ordnance Laboratory, White Oak, Md. Apr 1949. 36p photos, diagrs, graphs (part fold), tables. Order from LC. Mi $3.00, ph $6.30. PB 129243

Applicable formulas, methods of measuring and a system of recording wall deformations and collapsing strengths of plastic cylinders under external hydrostatic pressure are discussed. NOL M10205.

On the interaction of weak disturbances and a plane shock of arbitrary strength in a perfect gas, by C.T. Chang. Johns Hopkins University, Baltimore, Md. May 1956. 24p drawings. Order from LC. Mi $2.70, ph $3.30. PB 127954

The object of this paper is to study the influence of weak disturbances upstream of the shock on the flow field downstream of the shock. The basic flow pattern is taken as the one corresponding to a uniform supersonic stream past a two-dimensional wedge. The underlying hypotheses are those pertaining to the first order theory, the medium is assumed to be a nonviscous perfect gas with constant specific heats. This discussion is confined to an entropy disturbance of the step-function type. Taken from part of a dissertation submitted to the Faculty of Philosophy of JHU, Jun 1955. Project Squid. Contract N6ori-105, T.O. III, NR 098-038. JHU 12 -P.

Theoretical and experimental investigations of the mixing of a supersonic stream with an induced secondary stream as applied to ducted propulsive devices, by H.L. Pool and J.V. Charyk. Princeton University, Princeton, N.J. Sep 1950. 55p photos, drawings, diagrs, graphs. Order from LC. Mi $3.60, ph $9.30. PB 127946

Test results on certain aspects of ejector performance are reported including effects of such factors as primary to secondary jet area ratio, location of actuating jet, under and over expansion of supersonic primary jet nozzle, etc. Some typical test data are included for the case where chemical reaction occurs between the two fluid streams. Pressure and temperature distributions along the duct are included. An appendix treats the problem of constant area or constant pressure mixing according to the usual one-dimensional fashion. Appropriate selection of parameters permits of a solution in very simple form. Technical report no. 25. Project Squid. Contract N6 ori-105, T.O. III, NR 220-038.

Thermodynamic properties of air: Tables and graphs derived from the Beattie-Bridgeman equation of state assuming variable specific heats, by R.E. Randall. Aro, Inc., Tallahoma, Tenn. Aug 1957. 82p graphs (1 fold), tables. Order from LC. Mi $4.80, ph $13.80. PB 129559

The Beattie-Bridgeman equation of state was used to calculate several of the thermodynamic properties and flow process correction factors for air. The increase in the specific heats due to the vibration of diatomic molecules was included by assuming the molecules to be perfect harmonic oscillators. This report contains the equations used and the tabulated results of these calculations. Graphs are included to provide a general picture of the effects of temperature and pressure on the tabulated quantities. In order to illustrate the use of the tables, the calculation procedures and the results of several calculations are included. These procedures and results are for isentropic expansions and flow through normal shock waves. AD 135331. Contract AF 40(600)-700 Sup. 6(58-1). AF AEDC TR 57-8.

Thermodynamic properties of gases: Equations derived from the Beattie-Bridgeman equation of state assuming variable specific heats, by R.E. Randall. Aro, Inc., Tullahoma, Tenn. Aug 1957. 41p graphs (1fold), table. Order from LC. Mi $3.30, ph $7.80. PB 129905

The Beattie-Bridgeman equation of state was used to develop the equations of several of the thermodynamic properties and flow process correction factors for gases. The increase in the specific heats due to the vibration of diatomic molecules was included by assuming the molecules to be perfect harmonic oscillators. Thermodynamic and flow process equations are theoretically developed. The particular flow processes investigated were isentropic expansion and flow through normal shock waves. The calculation procedures for isentropic expansions and flow through normal shock waves are included in the appendix. Also included are the results of several calculations in which air was used as the media of flow. Graphs of the thermodynamic properties and Beattie-Bridgeman correction factors for air are included to provide a general picture of the effect of temperature and pressure. This is an elaboration of work reported in NAVORD 2148 (PB 122072). Contract AF 40(600)-700 Sup. 6(58-1). AD 135332. AF AEDC TR 57-10.

Unsteady laminar boundary layer over a flat plate in the downstream region, by S.I. Cheng and I.D. Chang. Princeton University. Dept. of

Aeronautical Engineering, Princeton, N.J. Mar 1956. 32p graphs. Order from LC. Mi $3.00, ph $6.30. PB 126657

The unsteady motion of a flat plate in an incompressible viscous fluid is studied by using Rayleigh's method. Formulas for calculating velocity profiles and skin friction are presented together with many examples to show their application. These results are then applied to the problem of a moving plate and the relationship between the velocity of the plate and the force applied is given and discussed. AD 82511. Contract AF 18(600)-498. PU AEL R 339. AF OSR TN 56-115.

Viscous dissipation in turbulent motion, by Max M. Munk. Catholic University of America, Washington, D.C. Jun 1956. 30p graph. Order from LC. Mi $2.70, ph $4.80. PB 126357

The correct expression for the rate of dissipation is derived. It is compared with the pseudo-dissipation much used in turbulence research. The error introduced by the substitution of the pseudo-dissipation is estimated. Laufer's pipe and channel tests are discussed. Some relations are computed from Laufer's results. The "secondary augmentation" is introduced and explained. For earlier reports see PB 124097, 124098 and 125861. Contract N6 onr-255 (T.O. 5).

Nuclear

Direct determination of primary cosmic ray alpha particle energy spectrum by new method, by Frank B. McDonald. Iowa State University. Physics Dept., Iowa City, Ia. Mar 1956. 60p drawing, diagr, graphs, tables. Order from LC. Mi $3.60, ph $9.30. PB 126321

The flux of cosmic ray alpha particles has been measured at $\lambda = 41^{o}$N and 55^{o}N and the energy spectrum in the region 883-285 Mev/nucleon has been determined by the use of a combination of a scintillation counter and Cerenkov counter. SUI 56-4. Jointly supported by the Office of Naval Research and the Atomic Energy Commission.

Isotopic spin in E 1 sum rules and Antisymmetrization and E 1 sum rules, by D.C. Peaslee. Purdue University, Lafayette, Ind. Nov 1956 - Dec 1956. 13p. Order from LC. Mi $2.40, ph $3.30. PB 124774

Two reports deal with E 1 sum rules. Electric dipole sum rules for light nuclei are separated according to the isotopic spin of the excited state by a suitable projection operator. Implications of this result relative to experiments are discussed. In the second part, a scheme is described for taking nuclear exchange correlations into account in E 1 sum rules. AD 115013 and AD 115012. Contract AF 18(600)-1579. AF OSR TN 56-588. AF OSR TN 56-587.

Model for multiple meson production, by E.M. Henley and T.D. Lee. Columbia University. Physics Dept. Nevis Cyclotron Laboratories, Irvington-on-Hudson, N.Y. Sep 1955. 55p graphs, table. Order from LC. Mi $3.60, ph $9.30. PB 124884

A model is presented for the multiple production of mesons. It is similar to that of Lewis, Oppenheimer, and Wouthuysen, but treats the spins and isotopic spins of the colliding nucleons as quantum mechanical operators. To illustrate the method, detailed calculations are carried out for a symmetrical scalar meson theory. Joint AEC-ONR program. Contract N6 ori-110, T.O. I. NEVIS 15. CU 95-9. R115.

Precision scattering of nuclear particles. Pittsburgh. University. Sarah Mellon Scaife Radiation Laboratory, Pittsburgh, Pa. Sep 1955. 39p graphs, tables. Order from LC. Mi $3.00, ph $6.30. PB 126276

Technical report no. VI. Contents: Scattering of 0.6-, 1.0-, and 1.7-mev electrons from aluminum and gold, by Robert T. Bayard and Y.L. Yntema (Reprinted from the Physical Review, Vol. 97, no. 2, Jan 15, 1955, pp. 372-379) Angular distributions of deuteron-induced reactions in lithium, by S.H. Levine, R.S. Bender and J.N. McGruer. (Reprinted from the Physical Review, Vol. 97, no. 5, Mar 1, 1955, pp 1249 - 1254). d,p reactions from C^{12} and C^{13}, by J.N. McGruer, E.K. Warburton and R.S. Bender. Contract N7 onr-32505, NR 022-068.

Scattering of K^{+} particles by protons, by Abraham Klein, B.H. McCormick and R. Sternheimer. Pennsylvania. University, Philadelphia, Pa. Sep 1956. 15p. Order from LC. Mi $2.40, ph $3.30. PB 124773

The scattering of positive K mesons by protons is investigated under the hypothesis that X mesons emit and absorb π mesons singly. AD 96227. Contract AF 18(603)-60. AF OSR TN 56-418.

Studies of low energy mesonic x-ray transitions and vacuum polarization effects in mesonic atoms, by Samuel Koslov. Columbia University. Physics Dept. Nevis Cyclotron Laboratories, Irvington-on-Hudson, N.Y. Jun 1956. 79p diagr, graphs, tables. Order from LC. Mi $4.50, ph $12.30. PB 125962

CU-101-ONR-110-1 - Physics. Thesis - Columbia University. 1. Mesotrons - Polarization 2. Spectra, Mesotron - Measurements 3. Atomic power - Research 4. Contract N6 ori-110, T.O. 1 5. NEVIS 19 6. R 123 7. CU 101

Theory of positron annihilation in solids, by R.A. Ferrell. Maryland. University. Physics Dept., College Park, Md. Contract Nonr-1797(00),

NR 017-618. Submitted for publication to Review of Modern Physics. Reviewed at International Conference on Electron Physics, University of Maryland, Apr 23-25, 1956. Order separate parts described below from LC, giving PB number of each part ordered.

Vol. I. Jun 1956. 82p table. Mi $4.80, ph $13.80. PB 126398

1. Atomic power - Research 2. Positrons-Destruction 3. Crystals, Ionic - Electrical properties 4. Metal ions - Reaction kinetics 5. UM TR 43, Vol. I

Vol. II. Jun 1956. 48p diagr, graphs. Mi $3.30, ph $7.80. PB 126399

UM TR 43, Vol. II.

Theory of the O^{+} states of O^{16+}, by A. Ferrell and William M. Visscher. Maryland. University. Physics Dept., College Park, Md. Dec 1955. 11p graphs. Order from LC. Mi $2.40, ph $3.30. PB 124815

Covers period of work from 1 Oct-15 Dec 1955. 1. Atomic power - Research 2. Neutrons - Energy distribution 3. Neutrons - Nuclear reactions 4. Contract Nonr-594(00), NR 017-610 5. UM TR 25

Timing circuit for the UCLA FM cyclotron, by Louis K. Jensen. California. University. Dept. of Physics, Los Angeles, Calif. Jan 1956. 7p diagrs. Order from LC. Mi $1.80, ph $1.80. PB 126146

A circuit has been constructed which supplies timing pulses for the various operating components of the UCLA F.M. cyclotron as well as counter gating pulses of variable widths and adjustable positions on the cyclotron duty cycle. The pulses are timed relative to a master pulse generated when the cyclotron oscillator passes through a specified frequency in the direction of decreasing frequency, thus giving only one master pulse per duty cycle. Overall stability of the timing circuit is about one μ sec. Technical report no. 24. Contract N6onr-275, T.O. IV, NR 022-053.

PHYSIOLOGY

Biological synthesis of protein with use of isotopes, by H. Borsook. California Institute of Technology. Division of Biology, Pasadena, Calif. Apr 1955. 7p. Order from LC. Mi $1.80, ph $1.80. PB 126154

It was necessary to work out the basic methods for the use of C^{14}- labeled amino acids in the studies of the synthesis of protein. The following C^{14}-labeled amino acids were synthesised: glycine, histidine, leucine, lysine, alpha-aminoadipic acid, and pipecolic acid and general conclusions are given. Contract N6 ori-102, T.O. 2, NR 122-107, Final report.

Bodily dimensions of the older pilot, by Edward I. Fry and Edmund Churchill. Antioch College, Yellow Springs, O. Jun 1956. 44p tables. Order from LC. Mi $3.30, ph $7.80. PB 130321

A comparison of 132 body dimensions on selected groups of older and younger pilots is presented. These groups are compared on their mean values of these dimensions, and more intensively on five percentile distributions of 20 dimensions. When differences exist between the groups, an explanation has been sought in terms of the physical process of ageing, and in selection. Most of the older-younger pilot differences are small and statistically non-significant, but a few are of great importance, and should be taken into account in designing Air Force equipment. AD 97217. Project no. 7214, Task no. 71728. Contract AF 18(600), 30. AF WADC TR 56-459.

Compressibility sense. U.S. Office of Naval Operations. Aviation Training Division. 1947. 30p. Order from LC. Mi $2.70, ph $4.80. PB 126917

1. Compressibility 2. Flying, High speed - Physiological effects 3. NAVAER 00-80Q-29

Critical review of quantitative methods for determining ketone bodies in biological fluids, by Frederick Sargent, II and E. Maxine McArthur. Illinois. University. Dept. of Physiology, Urbana, Ill. Feb 1953. 104p tables. Order from LC. Mi $5.70, ph $16.80. PB 127943

A critical review of methods for the determination of ketone bodies in biological fluids focused attention on four major methodological problems barring achievement of a reliable procedure: lack of a protein precipitant, quantitative separation of acetone from interfering substances, quantitative conversion of acetoacetic acid and β-hydroxybutyric acid to acetone, and verification of isopropanol as a ketone body. The method proposed was based on the formation of an hydrazone between acetone and acid-2, 4-dinitrophenylhydrazine. Includes bibliography of 106 items. AD 23166. Contract AF 18(600)-81. AF WADC TR 53-335.

Effect of reduced barometric pressure upon evaporation and perspiration in nude resting man, by Joseph W. McCutchan and Craig L. Taylor. California. University. Dept. of Engineering, Los Angeles, Calif. Sep 1954. 32p graphs,

tables. Order from LC. Mi $3.00, ph $6.30.
PB 127903

This report presents the results of an investigation to determine the effect of barometric pressure upon moisture evaporation from the human skin; and the correlation of perspiration rate with evaporation rate, even when skin temperature is held constant. The results show the inverse effect of barometric pressure upon evaporation, although data for the human body differs from data on wetted surfaces of physical objects. The results also show that perspiration rate can increase even though skin temperature decreases and does so with decreasing barometric pressure. AD 55901. Contract AF 33(616)-32. AF WADC TR 54-72.

Penetration of water into the human foot, by G. Edgar Folk, Jr. and Robert E. Peary, Jr. U.S. Climatic Research Laboratory, Lawrence, Mass. and Bowdoin College. Dept. of Biology, Brunswick, Me. Oct 1951. 49p diagr, graphs, tables. Order from LC. Mi $3.30, Ph $7.80.
PB 126420

Penetration of water from wet socks into the foot has been demonstrated, explaining the acceptability of impermeable footwear. It is shown that less sweat accumulates under an impermeable barrier which is placed near the foot (over one sock) than under a barrier placed at a greater distance from the foot. As measured by sweat chloride, production of sweat is not suppressed by an impermeable barrier but continues at an approximately normal rate. The reduced accumulation reflects an equilibrium reached between production and repenetration. Socks worn under impermeable barriers do not become excessively wet. The skin under such barriers does not become completely sodden, and discomfort, if any, is transient. Project: 7-64-06-001. Contract DA-44-109-QM-44. QMC EPS 131.

Regional heat loss by temperature gradient calorimetry, by A.C. Young, L.D. Carlson and H.L. Burns. Washington. University. School of Medicine. Dept. of Physiology and Biophysics, Seattle, Wash. Nov 1955. 14p diagrs, tables. Order from LC. Mi $2.40, ph $3.30.
PB 130251

Since 1949, a heat loss suit which measures heat loss by temperature gradient calorimetry has been used in laboratory and field tests. The suit has been repeatedly calibrated. As the development of the suit represents a unique use of temperature gradient calorimetry as well as a useful item for testing, a description of the suit together with calibration data is presented. Part of this work is described in AF TR 6248 (PB 104116). AF AAL Proj 8-7951, Report no. 2.

PSYCHOLOGY

Bibliography of perceptual-motor performance.
See entry under Bibliography on page 183.
PB 126371

Bibliography of unclassified research reports from U.S. Office of Naval Research. Psychological Sciences Division. Personnel and Training Branch. See entry under Bibliography on page 183.
PB 116382s

Analysis of job satisfaction, by John Schmid, Jr., Joseph E. Morsh and Howard M. Detter. U.S. Air Force. Air Research and Development Command. Air Force Personnel and Training Research Center, Lackland Air Force Base, San Antonio, Tex. Mar 1957. 11p table. Order from LC. Mi $2.40, ph $3.30. PB 126201

A job satisfaction scale consisting of 60 Likert-type items was prepared to measure attitudes of airmen to a variety of factors in their jobs. The scale was administered to 238 airmen who were receiving on-the-job training at one Air Force base. Homogeneous keying was applied to the responses. Three scales were developed and designated (1) Sense of Personal Achievement, (2) Attitudes toward the Supervisors, and (3) Stress. Using items which were unique to one scale only as a basis for clusters, a bifactor analysis was performed. AD 098935. AF PTRC TN 57-30.

Direction-of-knob-turn stereotypes, by James V. Bradley. U.S. Air Force. Air Research and Development Command. Wright Air Development Center. Aero Medical Laboratory, Wright-Patterson Air Force Base, Dayton, O. Jul 1957. 15p tables. Order from OTS. 50 cents.
PB 131612

Right-handed subjects were asked to grasp a knob and turn it so as to effect a specified change in the intensity of a light mounted just above it. Equal numbers of subjects were asked to increase and to decrease the brightness of the light, the request being phrased in a variety of ways. AD 130835. Project 7182, Task 71514. Tests done at Antioch College under AF 18(600)-50. AF WADC TR 57-388.

Enlisted personal inventory (Part I) as a predictor of personal adjustment after recruit training, by Arthur L. Benton and Harold P. Bechtoldt. Iowa State University. Dept. of Psychology, Iowa City, Ia. Jun 1955. 21p tables. Order from LC. Mi $2.70, ph $4.80. PB 124933

This report is primarily concerned with the ability of the Enlisted Personal Inventory (Part I) to predict the incidence of discharge for reasons of personal

unsuitability after the successful completion of recruit training. The medical and service records of 724 discharged men who had taken the Personal Inventory during the first week of recruit training were analyzed and the findings related to inventory score. Contract Nonr-311(00). NAVPERS TB 55-6.

Prerequisites for pair-scores to be used for assembling small work groups, by Thornton B. Roby. U.S. Air Force. Air Research and Development Command. Air Force Personnel and Training Research Center. Crew Research Laboratory, Randolph Air Force Base, Tex. Apr 1954. 20p tables. Order from LC. Mi $2.40, ph $3.30. PB 126203

It is shown that scores which express predicted compatibility between pairs of persons in small work groups, such as bomber crews, may have general usefulness for rational group assembly. However, if they are to be maximally useful for differential assignment to groups, they must satisfy certain statistical prerequisites: first, there should be a high degree of idiosyncratic choice in the compatibility scores between pairs of classes; second, there should be high mutuality or reciprocity of choice; and, finally, it should be true that persons who have high compatibility scores for each other should have similar compatibility scores for other classes. It is demonstrated that these prerequisities are most likely to be met if persons in each of the separate classes are ordered along dimensions which are relevant to their compatibility in the work situation. Project no. 7713, Task no. 77231. AF PTRC TR 54-13.

Reading linear scales: The contribution of eye movements to accuracy, by Thomas J. Coonan and Edmund T. Klemmer. U.S. Air Force. Air Research and Development Command. Cambridge Research Center. Operational Applications Laboratory, Bolling Air Force Base, Washington, D.C. Oct 1956. 11p photos, graphs. Order from LC. Mi $2.40, ph $3.30. PB 126760

This study relates a large decrease in scale reading errors found when exposure duration is increased from 0.15 sec. to 0.30 sec. to the occurrence of an eye movement and a second fixation in this time region. Subjects were tested in two scale reading tasks; one allowing only a single eye fixation; the second allowing two or more fixations. Exposure duration was varied from 0.10 sec. to 1.00 sec. in both tasks. AD 98829. AF CRC TN 56-8.

Relationships between sociometric measures and performance in medium-bomber crews, by Thornton B. Roby. U.S. Air Force. Air Research and Development Command. Human Resources Research Center. Combat Crew Training Research Laboratory, Randolph Air Force Base, Tex. Nov 1953. 15p tables. Order from LC. Mi $2.40, ph $3.30. PB 126197

The general purpose of this study was to determine whether sociometric ratings among aircrew members relate significantly to their performance on training missions. Three levels of analysis were investigated: (a) the relationship between individual sociometric "status" and individual performance measures; (b) the relationship between the ratings of one member of a crew-position pair for the other and their joint coordination rating; (c) the mean intracrew sociometric rating and crew performance measures. Project 511-023-0002. AF HRRC RB 53-41.

Risk and life experience: Development of a scale for measuring risk-taking tendencies, by E. Paul Torrance and Robert C. Ziller. U.S. Air Force. Air Research and Development Command. Air Force Personnel and Training Research Center. Crew Research Laboratory, Randolph Air Force Base, Tex. Feb 1957. 44p tables. Order from LC. Mi $3.30, ph $7.80. PB 126202

This study represents an attempt to develop and validate a biographical inventory scale to measure risk-taking tendencies against external measures of risk-taking behavior. The aim was to develop an instrument for future studies of behavior in emergency and extreme conditions and to gain a better understanding of the life experiences through which risk-taking tendencies are developed. AD 098926. Project no. 7713, Task no. 57157. AF PTRC TN 57-23.

Terminal system effectiveness as a function of the method used by controllers to obtain altitude information: Study of human engineering aspects of radar air traffic control, by Lowell M. Schipper, J.S. Kidd, Maynard Shelly and Alfred F. Smode. Ohio State University. Laboratory of Aviation Psychology, and Ohio State University Research Foundation, Columbus, O. Jun 1957. 26p tables. Order from OTS. 75 cents. PB 131605

The present report covers the seventh in a series of experimental system studies of human engineering aspects of air traffic control. The purpose of this research program is to provide estimates of the future level of system performance, and the potential contribution of human operators to such a system, that can be achieved by a judicious combination of human controllers and semi-automatic equipment, including advanced types of data acquisition, data storage, and data transfer equipment, and well-designed information displays. AD 118267. Project 7192, Task no. 71596. Contract AF 33(616)-3612. AF WADC TR 57-278.

Visibility in an empty visual field, by R.H. Brown and J.M. Carl. U.S. Naval Research Laboratory. Jan 1958. 8p diagr, graphs, tables. Order from OTS. 50 cents. PB 131476

Visibility is conventionally defined as detection of the presence of an object. In the present experiment, visibility was measured by the minimum visible, i.e., the threshold diameter of a black dot seen against a uniform white background. Independent variables were position of the dot in an empty field, individual differences between the eight observers, and the presence or absence of a fine reticle. NRL R 5072.

RUBBER AND RUBBER PRODUCTS

Development of high-low temperature aircraft canopy seals. Part I: New material seals of current design, by Joseph S. Islinger. Armour Research Foundation, Chicago, Ill. Jun 1956. 57p photos, drawings (part fold), diagrs, tables. Order from LC. Mi $3.60, ph $9.30. PB 128235

Silicone rubber seals were evaluated in Part I of a program to develop high-low temperature cabin pressurization and rain seals to be used with present and future aircraft canopies. Three seal designs considered to be representative of diaphragm, inflatable and non-inflatable canopy seals on current aircraft were evaluated. The seals fabricated from recently developed silicone elastomers, were to be capable of functional operation at extreme temperatures of -85°F and +200°F. The evaluation tests were conducted with each seal installed in a test fixture simulating a "half-size" aircraft canopy. Contract AF 33(600)-27588. ARF Proj M-058. AF WADC TN 55-441, Part 1.

TEXTILES AND TEXTILE PRODUCTS

Amplification and extended application of the theory of blend statistics, by Myron J. Coplan and William G. Klein. Fabric Research Laboratories, Inc., Dedham, Mass. Mar 1956. 28p graphs, table. Order from LC. Mi $2.70, ph $4.80. PB 126353

The study of blend distribution in woolen type yarns constituted an extensive early phase of this program. In conjunction with that work considerable emphasis was laid on development of statistical evaluation techniques. It was desired to extend the appropriate probability theory considerations to a more general level. This has now been accomplished and suitable statistical criteria have been derived for use with experimental methods of measuring blend composition which involve gravimetric analysis of finite lengths of yarn, roving, or sliver. The formulae may be conveniently employed in conjunction with the simple and rather common chemical analytic methods for fiber content; and they are shown to be valid for evaluation of blends produced in the cotton, worsted or woolen spinning system. Case no. C 51137. For earlier reports see PB 121343, 121471, 121471s and 124313. Contract N onr 478 (00), Technical report no. 3.

Development of Hypalon-coated Dacralon and its use in lightweight air-supported radomes, by Donald E. Setter. U.S. Air Force. Air Research and Development Command. Rome Air Development Center. General Engineering Laboratory, Griffiss Air Force Base, N.Y. Nov 1956. 36p tables. Order from LC. Mi $3.00, ph $6.30. PB 126445

This report covers the historical background, developmental efforts, and testing that brought Hypalon-coated Dacron into existence. The fabrication of a prototype radome thirty-five feet in diameter is also discussed, and further recommendations are included. AD 97760. Project no. 45384. AF RADC TR 65-100.

Replacement of indigo dyestuffs for use on Navy woolen fabrics. Part I: Preliminary survey, by G. Bradley. U.S. Naval Supply Activities. Clothing Supply Office, Brooklyn, N.Y. Jul 1956. 12p. Order from LC. Mi $2.40, ph $3.30. PB 125941

This report covers the first phase of research and development directed toward the accomplishment of this objective. A historical review of the use of indigo by the Navy is presented. Various classes of wool dyestuffs are discussed as possible indigo replacements. Future lines of work are indicated. Project no: NT 001-025. BUSANDA reports control symbol 3950-2. NAVSANDA RDR 10.

Summary of specification requirements for military fabrics, by Edwin B. Armstrong. U.S. Army. Quartermaster Research and Development Command. Textile, Clothing and Footwear Division, Quartermaster Research and Development Center, Natick, Mass. Revised. Dec 1957. 296p diagrs, tables. Order from OTS. $4.00. PB 131640

Specification requirements for military fabrics are summarized in tables which give details for yarn, fabric, and finish. Included are finishing and after-treatment specifications, and test methods. This report brings up to date and adds to the data contained in Textile Series Reports 56, dated August 1949, (PB 98573), and 67, dated February 1951, (PB 98573r). QMC TSR 102.

TRANSPORTATION EQUIPMENT

Aeronautics

Aircraft

Emergency uses of the parachutes. U.S. Office of Naval Operations. 1954. 24p drawings, diagrs. Order from LC. Mi $2.70, ph $4.80. PB 129847

Reprinted from Air Force Manual 65-15.
1. Parachutes - Uses 2. NAVAER 00-80T-53

Investigation of some parameters related to midair collisions of aircraft, by R. Byron Fisher and Wayne D. Howell. U.S. Civil Aeronautics Administration. Technical Development Center, Indianapolis, Ind. Oct 1957. 12p photos, diagrs, graphs. Order from OTS. 50 cents. PB 131468

This report contains analysis of past midair collisions and a summary of cockpit visual cutoff angles of some present-day aircraft. Information was obtained from 50 accident reports from 1949 through 1954. Analysis shows the angles at which the aircraft collided, the altitudes at which the collisions occurred, and the proximity of the accidents to airports. CAA TDR 322.

Study of new concepts for air cargo handling, by Clark Henderson and W. Grant Ireson. Stanford Research Institute, Stanford, Calif. Nov 1954. 89f photos, drawings, diagrs, tables. Order from LC. Mi $4.80, enl pr $15.30. PB 130314

This report deals with the problems of handling air cargo in ports of serial embarcation and thereafter until it reaches the point of use at a combat unit in a theater of operations. Also considered are the problems of transshipping between different cargo aircraft, different surface vehicles, and between surface and air systems. The purpose of this research program is to advance, for consideration and detailed study, new concepts for cargo handling and alternative means of achieving effective and economical service. Second printing, May 31, 1955. Contract AF 18(600)-577, T.O. V. SRI Proj 1117.

Airports and Airways

Further evaluation of a modified controllable-beam runway light, by James H. Harding, Cecil B. Phillips and Raymond C. Herner. U.S. Civil Aeronautics Administration. Technical Development and Evaluation Center, Indianapolis, Ind. Oct 1957. 15p photos, diagrs, graphs, tables. Order from OTS. 50 cents. PB 131494

This is the final report on an evaluation program previously described in TDR 238. A photometric analysis of the modified fixture was accomplished and a flight-test program initiated. CAA TDR 325.

Aerodynamics

Determination of preferred method of producing air temperatures encountered in flight by hypersonic aircraft and missiles, by J.M. Allen, J.F. Quirk, J.J. Ward, and D.R. Bussman. Battelle Memorial Institute, Columbus, O. Jul 1957. 72p diagrs, graphs, tables. Order from LC. Mi $4.50, ph $12.30. PB 129604

This report summarizes the investigation of (1) the feasibility of heating air to extremely high temperatures with equipment compatible with the requirements of large supersonic and hypersonic wind tunnels, and (2) the determination of a preferred method of producing this high temperature air. AD 131407. Contract AF 40(600)-680. AF AEDC TR 57-11.

Effect of blunting the nose of a flow angularity cone with 30° included angle, by Robert J. Guthrie. ARO, Inc., Tullahoma, Tenn. Jul 1957. 50p photos, drawings, diagr, graphs, tables. Order from LC. Mi $3.30, ph $7.80. PB 128685

Two nearly identical flow angularity cones with 30° included angle were calibrated at Mach numbers of 2.0, 3.1, and 3.5 over a range of angle of attack from +2.5 to -2.5°. The slope was experimentally determined for several configurations which differed in degree of bluntness of the cone. A flat 0.029-in diameter on the nose on a cone with the orifice located 0.40-in. behind the apex was the most blunt configuration tested. AD 131410. Contract AF 40(600)-700, Sup. 6(58-1). AF AEDC TN 57-22.

Effects of liquefaction of air on the pressure distribution and forces on a cone-cylinder body at M = 5.0, by W.T. Strike and W.N. MacDermott. ARO, Inc., Tullahoma, Tenn. Jun 1957. 43p drawings, diagrs, graphs, tables. Order from LC. Mi $3.30, ph $7.80. PB 128212

An investigation of the influence of liquefaction of air on the aerodynamic characteristics of a cone-cylinder model configuration at Mach number 5.0 was conducted in a 12-in. supersonic wind tunnel. Supply temperatures ranged from 130°F below saturation value to 60°F above saturation value, at a constant supply pressure of four atmospheres. Effects of liquefaction on the nozzle calibration as well as on the model pressure distribution and

overall integrated forces were determined. It was found that useful aerodynamic data could be obtained for a 30° to 138°F range beyond the onset of liquefaction in the ambient flow. AD 123509. Contract AF 40(600)-700. AF AEDC TN 57-14.

Lift, drag, and pitching-moment characteristics of AGARD calibration models A and B at Mach numbers 3.98 and 4.98, by C.J. Schueler. ARO, Inc., Tullahoma, Tenn. May 1957. 28p photos, drawings, graphs, tables. Order from LC. Mi $2.70, ph $4.80. PB 128778

In order to resolve some of the discrepancies in the comparison of data from supersonic wind tunnels, a correlation program was carried out during which two standard models were tested in major wind tunnel facilities here and abroad. Lift, drag, and pitching moments were determined. Contract AF 40(600)-700. AD 123507. AF AEDC TN 57-9.

Properties of test section walls with longitudinal slots in curved flow for subsonic and supersonic velocities (theoretical investigations), by Bernhard H. Goethert. ARO, Inc., Tullahoma, Tenn. Aug 1957. 21p diagrs, graphs. Order from LC. Mi $2.70, ph $4.80. PB 129430

Mathematical expressions for the boundary conditions of longitudinally slotted walls are derived in order to facilitate calculations to determine the effectiveness of slotted walls in wind tunnels. A relationship is first established for the effect of flow curvature on the boundary conditions in the vicinity of conventional slotted walls for incompressible flow. This relationship is then extended to include the influences of protruding slats as well as of perforated cover plates at the base of the slots. Finally the extent to which the derived equations are valid for compressible flow in the subsonic and supersonic speed range is shown. AD 131406. Contract AF 40(600)-700, Sup. 6(58-1). AF AEDC TN 55-56.

Test results of the AGARD calibration model B and a modified AGARD model C in the AEDC transonic model tunnel, by J.R. Milillo and H.L. Chevalier. ARO, Inc., Tullahoma, Tenn. May 1957. 30p photos, drawings, diagrs, graphs. Order from LC. Mi $2.70, ph $4.80. PB 128170

The lift, drag, and pitching-moment characteristics of the AGARD model B and a modified AGARD model C were obtained in the AEDC Transonic Model Tunnel. The models represent 2.5 percent tunnel blockage and were tested through a Mach number range from 0.7 to 1.5 and an angle-of-attack range from -2 to +10 degrees. The Reynolds number (based on body length) for the test was approximately 8×10^6. AD 123505. Contract AF 40(600)-700. AF AEDC TN 57-6.

Training and Training Devices

Evaluation of the Link, ME-1, basic instrument flight trainer, by John C. Townsend. U.S. Air Force. Air Research and Development Command. Air Force Personnel and Training Research Center. Operator Laboratory, Randolph Air Force Base, Tex. Jun 1956. 91p photos, drawings, diagrs, graphs, tables. Order from LC. Mi $5.40, ph $15.30. PB 126219

1. Flight training - Instruments 2. Link trainers - Instruments 3. AF PTRC TN 56-84

Rockets and Jet Propulsion

Contributions to jet pump theory, by H.B. Helmbold. Wichita. University. School of Engineering, Wichita, Kans. Contract Nonr 201(01). Order separate parts described below from LC, giving PB number of each part ordered.

I. Comparison of ideal mixing processes. Jun 1953. 16p photos, drawings, diagrs, graphs, tables. Mi $2.40, ph $3.30. PB 127093

The subject of this investigation is the study of the influence of a pressure gradient on the economy of the incompressible mixing process. For this purpose the efficiencies of perfect mixing processes in a constant-diameter mixing tube and in a constant-pressure mixing tube are compared. AD 74375. UW ER 105.

V. Simplified theory of the plane jet in a parallel stream under constant pressure. May 1954. 15p graphs (1 fold), table. Mi $2.40, ph $3.30. PB 126312

A simplified theory of the two-dimensional (plane) jet based on the assumption of excess velocity profile affinity is described. The results are applicable to the design of mixing channels for two-dimensional jet pumps as well as to the study of the effects of a blowing jet on an airfoil. For Parts II-III see PB 124625 and 124626. Table is labelled no. VI. UW ER 137.

Project Vanguard report. U.S. Naval Research Laboratory. Order separate parts described below from OTS, giving PB number of each part ordered.

No. 23: Minitrack report no. 3: Receiver system, by V.R. Simas and C.A. Bartholomew. Dec 1957. 31p diagrs, graphs. $1.00. PB 131390

This report describes, with schematics, the five units comprising a single rf channel, i.e., a pair of front ends, a signal adder, a combined i-f amplifier, a special local oscillator, and a calibration source. NRL R 5055.

No. 24: Minitrack report no. 4: Satellite telemetry receiver system, by V.R. Simas. Jan 1958. 17p diagr (fold), graphs. 50 cents. PB 131396

Scientific information from the artificial earth satellites will be transmitted to the telemetry systems located at each of the Minitrack stations. The telemetry receiver will amplify the received signals with the addition of as little receiver noise as possible and convert the information to a form which permits demodulation and subsequent analysis. The receiver is of the double-conversion type with crystal-controlled local oscillators. Three pre-detection bandwidths are available which provide a means of increasing the output signal-to-noise ratio for those experiments in which the information bandwidth is less than the maximum. Grounded-grid preamplifier circuitry is employed to achieve stability and a low noise figure. For Minitrack reports no. 1-3 see PB 131220, 131330 and 131390. NRL R 5065.

Progress report on the stability of liquid films for cooling rocket motors, by M.J. Zucrow, C.M. Beighley and E. Knuth. Purdue University. Purdue Research Foundation, Lafayette, Ind. Nov 1950. 34p diagrs, graphs, table. Order from LC. Mi $3.00, ph $6.30. PB 130311

The method selected for investigation is based on injection of the coolant through a slot around the circumference of the combustion chamber or nozzle, based on employing parallel flat rings spaced a small distance apart. Reprint from Journal of the American Rocket Society. Project Squid. Contract N6 ori-104, T.O. 1, NR 220-042, Phase 7. PUR-22-R.

Rocket research report, by Milton W. Rosen and James M. Bridger. U.S. Naval Research Laboratory. Order separate parts described below from LC, giving PB number of each part ordered.

No. 1: Viking no. 1 firings. Dec 1949. 116p photos, drawings (part fold), diagrs (part fold), graphs, tables. Mi $6.00, ph $18.30. PB 129125

The Viking #1 rocket and its instrumentation together with the operations at the White Sands Proving Ground during static and flight tests of the rocket are described. Results of the first and second static firings and the flight firing are presented with the significant data obtained. Appendix A is a comparison of the observed flight trajectory with trajectories computed before and after the flight. In Appendix B an analysis of the power plant performance is presented with emphasis on the problem of obtaining maximum use of propellants through mixture ratio adjustment. In Appendix C the control system's performance is evaluated in terms of the rocket's bearing and inclination during powered flight. The transformation of coordinates used to obtain heading and inclination from gyroscope signal readings is developed in Appendix D. Declassified 15 Dec 1953. NRL R 3583.

No. II: Viking no. 2 firings. Mar 1950. 60p photos, drawings, diagrs (part fold), graphs, tables. Mi $3.60, ph $9.30. PB 129126

On September 6, 1949 the launching and flight of Viking No. 2 rocket was achieved at White Sands Proving Ground, New Mexico. The static and flight firings produced significant data on measurement of rocket performance. Rocket-borne and range instrumentations functioned satisfactorily. The design of the rocket structure, power plant and control system was again shown to be sound basically. It was determined that numerous modifications will be required before the rocket can be considered acceptable as an upper air research vehicle. Declassified 15 Dec 1953. NRL R 3641.

No. IV: Viking no. 3 firings. Jul 1950. 80p photos, drawings, diagrs (part fold), graphs, tables. Mi $4.50, ph $12.30. PB 129124

On February 9, 1950 the launching and flight of the third Viking rocket was conducted at White Sands Proving Ground, New Mexico. The rocket deviated from its intended course and was shut off by radio command after 60 seconds of powered flight. Good data were obtained from the rocket-borne and range instrumentation except for telemetering in which some channels were sporadic. Upper air research experiments carried in this rocket were successful. Of the seven major changes and numerous minor modifications made in Viking No. 3, only the control system changes proved to be unsatisfactory. Declassified 15 Dec 1953. NRL R 3716.

No. V: Viking shipboard firings. Oct 1950. 88p photos, drawings, graphs, tables. Mi $4.80, ph $13.80. PB 129123

On May 11, 1950 the Viking No. 4 rocket, launched from the USS NORTON SOUND at the equator in the Pacific Ocean, reached an altitude of 105 miles. This firing and the associated studies, preparations and operations were conducted to meet the scientific and

military objectives of Project Reach. The rocket carried 900 pounds of instruments designed to study cosmic radiation and the equatorial upper atmosphere. The feasibility of firing a large stabilized rocket from shipboard was proven through the design and use of a fixed rail launcher which provided lateral restraint for the rocket prior to and during its launching period. Declassified 15 Dec 1953. NRL R 3751.

No. VII: Viking no. 5 firings. Jul 1951. 63p photos, drawings, graphs, tables. Mi $3.90, ph $10.80. PB 129122

On November 21, 1950, the launching and flight of the fifth Viking rocket were conducted at White Sands Proving Ground, New Mexico. The rocket reached a peak altitude of 108.3 miles with a burning time of 79 seconds. The performance of the power plant and of the control system during powered flight was excellent. Good data were obtained from the rocket-borne and range instrumentation, and telemetering coverage was practically complete. The large amount of trajectory information obtained from both rocket-borne and ground-based sources was assembled and compared. The principal upper-air research experiments performed in the rocket were devoted to measurements of the ionosphere and of ion-producing radiations. These experiments were highly successful. Recovery after impact was good. Records obtained by the aspect cameras which photographed the earth's horizon and the sun were compared with data from ground-based telescopes and with telemetered gyroscope data. The elimination of control-system noise on the launching stand and the development of improved pump-propellant servicing equipment facilitated preflight operations. Declassified 15 Dec 1953. NRL R 3830.

No. XII: Viking no. 8 firing . Jul 1953. 59p photos, drawings, graphs, tables. Mi $3.60, ph $9.30. PB 129121

The eighth Viking Rocket, the first model of the new RTV-N-12a configuration, was never brought to the flight firing stage. During the static firing at White Sands Proving Ground, New Mexico on Jun 6, 1952, coupled vibrations between the motor and structure exceeded static load limits and caused the rocket to tear loose from its launching stand after 15 seconds of burning. Flying in static firing condition, the rocket continued under power until cut off by radio at 61 seconds. Some of the problems encountered in the redesign of the rocket to the new configuration are described in the text and in Appendices B and C. For other reports see PB 102004, 129128, 119772, 129127, 119796 and 119809. Declassified 15 Dec 1953. NRL R 4169.

Some considerations of film cooling for rocket motors, by M.J. Zucrow and A.R. Graham. Purdue University, Lafayette, Ind. Oct 1956. 42p photos, diagrs, graphs. Order from LC. Mi $3.30, ph $7.80. PB 127960

Basic considerations pertinent to the film cooling of a circular duct are presented. Results obtained from experiments concerning film cooling in a rocket motor are divided into (a) the film coolant flow required to cool a given length, and (b) the effect of film cooling upon rocket motor performance. Presented at the American Rocket Society Fall Meeting, Buffalo, N.Y. Sep 24-26, 1956. Project Squid. Contract N6ori-105, T.O. III, NR 098-038. PUR-29-P.

Theory of unstable combustion in liquid propellant rocket systems, by Martin Summerfield. Princeton University, Princeton, N.J. Apr 1951. 19p drawings, graphs. Order from LC. Mi $2.40, ph $3.30. PB 126282

On the basis of an hypothesis that low frequency oscillations ("chugging") sometimes observed in liquid propellant rocket engines are the result of oscillatory propellant flow induced by a combustion time lag, conditions for the suppression of such oscillations are derived. It is found that stability can be achieved by increases in the length of feed line, the velocity of the propellant in the feed line, the ratio of feed pressure to chamber pressure, and the ratio of chamber volume to nozzle area. Equations are given for the frequencies of oscillation. Examination of the equation for stability indicates that self-igniting propellant combinations are likely to be more stable than non-self-igniting systems. Project Squid. Contract N6 ori 105, T.O. III, NR 220-038. PU TR 43-R.

Upper-atmosphere research report no. XXXII: History of the upper-air rocket-research program at the Naval Research Laboratory, 1946-1957, by J.W. Townsend, Jr., H. Friedman and R. Tousey. U.S. Naval Research Laboratory. Feb 1958. 52p photos, graphs. Order from OTS. $1.50. PB 131521

In 1946 the Naval Research Laboratory initiated a program of basic research in the physics of the upper atmosphere by means of high-altitude sounding rockets. Since that time the Laboratory has instrumented and flown 104 rockets carrying upper-air research experiments. This effort has resulted in the publication of approximately 300 scientific papers in the open literature and in a number of notable initial measurements of high-altitude physical parameters. On the practical side, there have been a number of applications which have developed as a result of this upper-air rocket-research program. Since the program is on a continuing basis, it can be expected that further scientific results will be forthcoming, not only from future rocket flights but from data from past firings which have been analyzed in the light of current data. NRL R 5087.

Atomic propulsion of merchant ships, by Emil Jansen and Jens Wilhelmsen, Jr. Norway. Joint Establishment for Nuclear Energy Research, Kjeller, Norway. Mar 1956. 22p graphs, tables. Order from LC. Mi $2.70, ph $4.80. PB 126226

The object of the present economic study is to determine the size and speed of a nuclear powered vessel which will give maximum net return on invested capital, and to compare the estimated net annual return for nuclear powered vessels with that of conventionally powered vessels. Such a comparison should indicate the size, speed, freight rates and voyage lengths which would favor the application of nuclear power. This preliminary study includes only vessels powered by reactors. So far, no attempt has been made to make similar studies for other reactor types. Progress report, 1955. Introduction by Odd Dahl. JENER 43.

Determination and occurrence of nickel in sea water, marine organisms and sediments, by Taivo Laevastu and Thomas G. Thompson. Washington. University. Dept. of Oceanography, Seattle, Wash. Aug 1956. 21p graphs, tables. Order from LC. Mi $2.70, ph $4.80. PB 126290

Methods for the analysis of nickel in sea water, in particulate material, and in marine organisms were investigated and modified. Nickel was satisfactorily recovered from sea water using sodium carbonate solution as the precipitant. In the preliminary treatment of marine organisms for nickel analysis, wet combustion was preferred to direct ashing as considerable nickel appears to be carried off with the smoke. Technical report no. 50. Reference 56-12. Extrait du Journal du Conseil International pour L'Exploration de la Mer, Vol. XXI, no. 2, 1956. University of Washington, Dept. of Oceanography Contribution no. 192. Contract N8 onr-520/III, NR 083-012. WU OR 56-12.

Martin model 270 water loads investigation. Glenn L. Martin Co., Baltimore, Md. Contract NOa(s) 11064, Amendments 14 and 15. Order separate parts described below from LC, giving PB number of each part ordered.

Hull bottom pressures and impact loads, by Douglas A. King and Richard C. Adams. Nov 1955. 161p photos, drawings (part fold), diagrs (part fold), graphs (1 fold). Mi $7.80, ph $25.80. PB 126388

The smooth-water landing loads on the Martin Model 270 seaplane were investigated to obtain data on a high length-beam ratio, long-afterbody hull with a rounded forebody keel. This report discusses the water pressures and overall impact loads, while the structural reactions of the airplane are dealt with in Engineering Report No. 7515, (PB 126428). To help assess the effects of the rounded keel (which produced forebody sections approximating theoretical constant-force sections), drop-tests were made of a test specimen having the same shape and structure as a portion of the forebody. A semi-empirical theory is presented by means of which water pressures and overall loads can be calculated for hull bottoms of simple or complex cross sections. The effects of chine immersion or heavy beam loadings are satisfactorily predicted by the theory. ER 7516.

Structural and impact loads considering airplane flexibility, by Robert W. Schwab and E. Widmayer, Jr. Nov 1955. 128p photos, drawings (part fold), diagrs, graphs (part fold), tables (part fold). Mi $6.30, ph $19.80. PB 126428

A theory for calculating structural loads due to water landing impact has been developed. This theory has, for the most part, been substantiated by the results of an experimental program in which both the input function (hull bottom loads) and response (accelerations) of the M-270 airplane were measured. ER 7515.

Philippine interisland shipping, by Frederick L. Wernstedt. Pennsylvania State University, University Park, Pa. Jan 1956. 8p map. Order from LC. Mi $1.80, ph $1.80. PB 124705

Work has been directed along the following four main lines: 1. Assessment and inventory of the actual physical facilities for interisland freight and passenger movements. a. Present shipping fleet; b. Present port and terminal facilities. - 2. Analysis of cargo and passenger movements. a. Ports of origin; b. Ports of destination; c. Types of commodities; d. Quantities. - 3. Analysis and synthesis of motivative forces responsible for the present interisland commerce. a. Growth and continued development of surplus and deficit producing regions; b. Growth and development of a recent trend toward direct export overseas from production sites. - 4. Evaluation of: a. The effectiveness of the present interisland trade setup. b. Future needs for effective interisland commerce. Contract Nonr-656

Review of the development of visual aids for operations in night replenishment at sea, by G.T. Hicks and B.G. Kroger. U.S. Naval Research Laboratory. Jan 1958. 15p graphs, tables. Order from OTS. 50 cents. PB 131421

The visual problems encountered in night replenishment are enumerated and analyzed, and the experiments performed by others in past years toward the development of light sources to aid in night re-

plenishment operations are summarized. An account is given of recent work performed by NRL and COMSERVLANT on the use of a zinc sulfide phosphorescent paint to illuminate the projectile and heaving line in the line-throwing rig. It is suggested that phosphorescent paints also replace red flashlights on the fueling rig. NRL R 5064.

Study of a controlled acoustical experiment in a water tank at 213 kc, by W.G. Neubauer. U.S. Naval Research Laboratory. Jan 1958. 11p diagrs, graphs. Order from OTS. 50 cents. PB 131474

In a bounded, controlled underwater sound experiment in a tank when no sound absorbent lining is used, the region of valid experimentation is limited. Limitations are physical effects occurring which cause a received signal to vary from the preassigned criterion of inverse loss of pressure with distance between source and receiver. Departure from this criterion results from (a) unwanted reflections from boundaries, (b) electronic noise, and (c) the "near-field" of the source. Limitations also exist as a result of the nonuniform radial pressure pattern of the source. The experimental measurements are found to be accurate to ±2% of the received voltage. To this degree, at the frequency used (213kc), the common wave equation and assumptions involved in its derivation and further manipulations are considered valid analytical descriptions of the behavior of the acoustic field. NRL R 5069.

WATER SUPPLY, SANITATION AND PUBLIC HEALTH

Development of a suitable test procedure to determine filtration efficiency, by C.E. McCreary. U.S. Naval Air Material Center. Aeronautical Materials Laboratory, Naval Air Experiment Station, Philadelphia, Pa. Aug 1954. 40p drawings, graphs, tables. Order from LC. Mi $3.00, ph $6.30. PB 129687

A satisfactory method for evaluating filtration efficiency of AN 6236-2 reservoir elements has been developed and inclusion of this method in a revision to Specification MIL-F-5504 is recommended. Covers period 9 Sep 1952-14 Jul 1954. NAM AML AE 6230.

Selected bibliography on water pollution caused by the pulp and paper industry. See entry under Bibliography on page 184. PB 126145

MISCELLANEOUS

Annual report of research supported by the Office of Naval Research. Michigan. University. Institute for Social Research, Ann Arbor, Mich. Dec 1954. 32p. Order from LC. Mi $3.00, ph $6.30. PB 125053

1. Scientific research

Descriptive continuum: "Generalized" theory of indexing, by Frederick Jonker. Documentation Inc., Washington, D.C. Jun 1957. 28p drawings. Order from LC. Mi $2.70, ph $4.80. PB 128787

This article first notes the importance of the indexing problem in mechanized information retrieval: not only is the degree to which information can be retrieved entirely determined by the adequacy of the system of indexing, but the total cost of the mechanized information control system is to a large extent likewise determined by the indexing system. In an attempt to find such criteria common to all indexing systems, and establish a "generalized theory" of indexing, the history of information control is traced from the earliest classification systems through subject heading systems to the latest developments such as Uniterm indexing. AD 132358. Contract AF 49(638)-91. AF OSR TN 57-287.

Procedures in the descriptive analysis of terrain. Annual summary report on investigation, by Edwin H. Hammond. Wisconsin. University. Dept. of Geography, Madison, Wis. Jan 1956. 4p. Order from LC. Mi $1.80, ph $1.80. PB 126304

1. Terrain data - Analysis 2. Contract N onr-1201(01).

Proceedings of the President's Conference on Technical and Distribution Research for the Benefit of Small Business, Washington, D.C., Sep 23-25 1957. 298p. Order from OTS. $2.50. PB 131460

The proceedings constitute a small business man's guide to the research assistance that he may receive from other small businesses, large businesses, Federal and State agencies, colleges and universities, trade associations, private research and development organizations, trade publications, professional societies, technical libraries, and local business organizations. The book also details how small businesses have used this assistance to their advantage and makes recommendations for future utilization of research information. Discussions were given by authoritative speakers on such topics as the problems and growth opportunities for

small business, the attitudes of small business toward technical and distribution research, and reports of nationwide surveys conducted among small businessmen on product development and distribution research. In addition to these general sessions, the conference was broken down into special technical and distribution sessions and work shops.

Report of NRL progress. U.S. Naval Research Laboratory. Mar 1958. 60p. Order from OTS. $1.25. Also available at annual subscription rate of $10.00 a year in the U.S.A., foreign rate $13.00 a year. PB 131681

Contents: Articles: Toward a solution of the aircraft-collision problem, by P.J. LaRochelle and R.E. Brescia. - Investigation of anomalous "brittle" failure of heavy forgings at elevated temperatures, by A.B. Babecki and P.P. Puzak. - Radiation-shielding research at NRL, by L.A. Beach. - Scientific program: Problems accepted: Problem notes: Applications research: Characteristics of scanning-search-radar echoes... Development of a reciprocal-time generator... Progress toward a mathematical model for use in the study of naval combat information requirements. - Chemistry: Effect of corrosion and growth on the life of cycling lead-acid cells. - Mechanics: Transistorized preamplifier for shock and vibration instrumentation... Pulse-jet combustor applications. - Metallurgy and ceramics: Theory of creep of a dispersion-hardened alloy... Iron-chromium-aluminum alloys offer excellent prospects of improved service as boiler-tube support materials... Evaluation of five chemically pure $BaTiO_3$ samples by their differential thermal analysis characteristics. - Nuclear and atomic physics: Neutron-diffraction studies of the magnetic structure of solids... Standard x-ray field range for calibrating radiac instruments... Research reactor electronics. - Radio: Transonde radio improvements... World-wide comparison of frequency and time... Surface resistivity of semiconductors... A new Y-type circulator. - Solid-state physics: Dynamics of 1D ionic lattices. - Supporting techniques: An extended range polarograph. - Published reports. - Papers by NRL staff members. - Patents.

Research, problem-solving, and the use of technical information in small and medium sized manufacturing firms. Herner, Meyer and Co., Washington, D.C. 1958. 29p tables. Order from OTS. 75 cents. PB 131578

In 1955 the European Productivity Agency of the Organization for European Economic Co-operation embarked upon an eight-nation study to determine the methods and facilities used by small and medium-sized manufacturers to solve technical problems and to keep abreast of pertinent technical developments. This report incorporates findings of the American part of the survey. It is based on the answers to a set of standardized questions used in all the participating countries and supplemented by a set of questions of specific interest to the Office of Technical Services in its role as a disseminator of technical information to American industry.

Russian-English glossary, aeronautical and miscellaneous technical terms. U.S. Air Force. Technical Documents Liason Office, Wright-Patterson Air Force Base, Dayton, O. Nov 1956. 702p. Order from OTS. $7.00. PB 131634

Contains approximately 30,000 terms, with emphasis placed on compound terms which frequently present difficulties for translators and evaluators in rendering idiomatically accurate translations.

Scientific investigations in Micronesia: Geology of Kapingamarangi Atoll, Caroline Islands, by Edwin D. McKee. National Research Council. Pacific Science Board. Apr 1956. 79p maps, diagr, graphs, tables. Order from LC. Mi $4.50, ph $12.30. PB 125936

SIM report no. 23. 1. Atolls - Micronesia 2. Geology - Kapingamarangi Atoll, Caroline Islands 3. Contract N7onr-291(54), NR 388-001

ATOMIC ENERGY COMMISSION REPORTS

Reports may be purchased in accordance with instructions on the inside front cover of the U. S. GOVERNMENT RESEARCH REPORTS. As PB numbers are not indicated, order by series and number. These reports may also be consulted at any AEC Depository Library. A list of these libraries may be obtained from the U. S. Department of Commerce, Office of Technical Services, Washington 25, D. C.

Reproduction in whole or part of any report listed herein is encouraged by the U. S. Atomic Energy Commission, subject to the approval of authors or originating sites. General inquiries from the industrial press about AEC-developed information should be directed to the Industrial Information Branch, Atomic Energy Commission, Washington 25, D. C.

Biology and Medicine

Effect of epinephrine on serum lipoproteins, by Wei Young and Thomas L. Hayes. University of California, Radiation Laboratory. Berkeley, Calif. November 1957. Contract W-7405-Eng-48. 11p. Order from OTS. 50 cents. UCRL-8049

Chemistry—General

Chemistry Division, Section C-II Summary Report - October, November, and December 1948. Argonne National Lab., Lemont Ill. July 1949. Decl. Mar. 18, 1957. Contract W-31-109-Eng-38. 64p. Order from LC. Mi $3.90, ph $10.80. ANL-4288 (Rev.)

Chemistry Division, Section C-I Quarterly Report - July, August, and September 1952, by D. W. Osborne, ed. Argonne National Lab., Lemont, Ill. November 1952. Decl. Feb. 7, 1957. Contract W-31-109-Eng-38. 31p. Order from LC. Mi $3.00, ph $6.30. ANL-4943 (Rev.)

Reactions yielding volatile oxides at high temperatures; free energies of gaseous Al_2O, ZrO, ThO, TaO, ZrO_2, ThO_2, TaO_2, UO_2 and WO_3, by R. J. Ackermann and R. J. Thorn. Argonne National Laboratory. Lemont, Ill. January 1958. Contract W-31-109-Eng-38. 25p. Order from OTS. 75 cents. ANL-5824

A test for solvent quality, by T. P. Garrett, Jr. E. I. du Pont de Nemours & Co. Savannah River Lab., Augusta, Ga. August 1957. Contract AT (07-2)-1. 16p. Order from OTS. 50 cents. DP-237

The determination of fluoride in plutonium fluorides, by B. B. Murray. E. I. du Pont de Nemours & Co., Savannah River Lab., Augusta, Ga. November 1957. Contract AT (07-2)-1. 11p. Order from OTS. 50 cents. DP-247

Review of Ames thorium process, by E. W. Mautz and O. R. Magoteaux. National Lead Co. of Ohio, Cincinnati. (1953?). Decl. Mar. 13, 1957. Contract AT (30-1)-1156. 49p. Order from LC. Mi $3.30, ph $7.80. FMPC-131

Separation of uranium from diverse ions: Study of the hexone liquid-liquid extraction system, by William J. Maeck and others. Phillips Petroleum Company. Atomic Energy Div., Idaho Falls, Idaho. December 1957. Contract AT (10-1)-205. 20p. Order from OTS. 75 cents. IDO-14415

The oxidation of mercury by nitric acid, by H. Schneider and R. F. Murray. Phillips Petroleum. Atomic Energy Div., Idaho Falls, Idaho. November 1957. Contract AT (10-1)-205. 22p. Order from OTS. 75 cents. IDO-14423

Determination of burnout limits of polyphenyl coolants, (summary report), by T. C. Core and K. Sato. Aerojet-General Corporation. Azusa, California. February 1958. Contract AT (04-3)-44, Section 4. 91p. Order from OTS. $2.50. IDO-28007

Application of tributyl phosphate extraction of uranium to Works Laboratory samples, by T. W. Bartlett. Carbide and Carbon Chemicals Co. K-25 Plant, Oak Ridge, Tenn. July 1951. Decl. Feb. 12, 1957. Contract W-7405-Eng-26. 9p. Order from LC. Mi $1.80, ph $1.80. K-789

Belgian symposium on chemical processing. II. Session: Aqueous reprocessing. Application of mixer-settlers to the Purex process, by J. K. Davidson, A. C. Shafer, Jr. and W. O. Haas, Jr. Gen. Electric Co. Knolls Atomic

Power Laboratory. Schenectady, N. Y. May 1957. Contract W-31-109-Eng-52. 25p. Order from OTS. $ 1.00. KAPL-1809

Determination of uranium in UO_2-Al_2O_3 fuel elements by X-ray emission spectrography, by W. D. Moak, W. J. Pojasek. General Electric Company, Knolls Atomic Power Laboratory. Schenectady, New York. Sept. 1957. Contract W-31-109-Eng-52. 9p. Order from OTS. 50 cents. KAPL-1879

Semi-micro determination of uranium in uranium dioxide-alumina ceramics, by V. F. Consalvo and J. Rynasiewicz. Knolls Atomic Power Lab., Schenectady, N. Y. November 1957. Contract W-31-109-Eng-52. 11p. Order from LC. Mi $2.40, ph $3.30. KAPL-M-JR-10

Instrument and mechanical development department report on dynamic corrosion testing program, Job 15. Kellex Corp., New York. June 1949. Decl. Feb. 26, 1957. Contract W-31-109-Eng-52, subcontract G-148. 21p. Order from LC. Mi $2.70, ph $4.80. KLX-1040

Electrokinetic processes--nuclear aspects. Quarterly progress report for February 1-April 30, 1955, by James J. Shyne and others. Vitro Labs., West Orange, N. J. May 1957. Decl. with deletions Feb. 28, 1957. Contract AT (30-1)-850. 21p. Order from LC. Mi $2.70, ph $4.80. KLX-10001 (Del.)

Design, construction, and operation of a pulse column for the purification of zirconium, by G. R. Jasny and others. Massachusetts Inst. of Tech., Oak Ridge, Tenn. (Engineering Practice School). May 1950. Decl. Mar. 4, 1957. Contract W-7405-Eng-26, subcontract 70. 19p. Order from LC. Mi $2.40, ph $3.30. KT-69

Operation of a pulse column for the production of hafnium-free zirconium, by J. B. Robinson and H. T. Tupper. Massachusetts Inst. of Tech., Oak Ridge, Tenn. (Engineering Practice School). May 1950. Decl. Mar. 1, 1957. Contract W-7405-Eng-26, subcontract 70. 13p. Order from LC. Mi $ 2.40, ph $3.30. KT-70

Electrophoretic deposition of plutonium, (a feasibility study), by K. A. Walsh. Los Alamos Scientific Laboratory of the Univ. of Calif. Los Alamos, N. Mex. Jan. 1958. Contract W-7405-Eng-36. 12p. Order from OTS. 50 cents. LA-2153

Conductivity of polymer-water mixtures determination of water in polymer, by Nestor Sabi. Columbia Univ., New York. Substitute Alloy Materials Labs. Aug. 1944. Decl. Mar. 5, 1957. 3p. Order from LC. Mi $1.80, ph $1.80. M-913

Purification and physical properties of 1, 1, 2, 2-tetrafluorodinitroethane, by Jack W. Frazer and Russell H. Sanborn. University of California . Radiation Lab., Livermore Site, Livermore, Calif. October 1957. Contract W-7405-Eng-48. 11p. Order from OTS. 50 cents. UCRL-4978

Chemistry—Radiation and Radiochemistry

Zirconium-95 as a fission monitor, by W. A. Brooksbank, Jr. Oak Ridge National Lab., Tenn. July 1956. Decl. Mar. 13, 1957. Contract W-7405-Eng-26. 4p. Order from LC. Mi $1.80, ph $1.80. CF-56-7-61

Development of radioanalytical methods for HRT, by T. H. Handley and S. A. Reynolds. Oak Ridge National Lab., Tenn. July 1956. Decl. Mar. 12, 1957. Contract W-7405-Eng-26. 11p. Order from LC. Mi $2.40, ph $3.30. CF-56-7-118

Radiochemical studies of fission products and activated corrosion products in the coolant of test loops for SAR fuel elements at the materials testing reactor, by W. C. Judd and F. J. Witt. Knolls Atomic Power Lab., Schenectady, N. Y. Aug. 1957. Contract W-31-109-Eng-52. 14p. Order from LC . Mi $2.40, ph $3.30. KAPL-M-WCJ-2

Chemistry—Separation Processes for Plutonium and Uranium

Isolation of U-233 from irradiated slugs using TBP as the extractant, by C. V. Ellison. (Quarterly report for February 10-May 10, 1952). May 1952. Decl. Apr. 2, 1957. Contract W-7405-Eng-26. 6p. Order from LC. Mi $1.80, ph $1.80. CF-52-5-144

$Ca(OH)_2$ contactors for Thorex solvent recovery system, by W. R. Winsbro. Oak Ridge National Lab., Tenn. Oct. 1952. Decl. Apr. 2, 1957. Contract W-7405-Eng-26. 8p. Order from LC. Mi $1.80, ph $1.80. CF-52-10-26

Thorex process: Continuous dissolver development program quarterly report for period November 1, 1952-February 1, 1953, by D. L. Foster. Oak Ridge National Lab., Tenn. Mar. 1953. Decl. Feb. 14, 1957. 11p. Order from LC. Mi $1.80, ph $1.80. CF-53-3-208

25 process assistance for period of April 18, 1955 to April 29, 1955, by F. L. Culler. Oak Ridge National Lab., Tenn. May 1955. Decl. with deletions Feb. 14, 1957. Contract W-7405-Eng-26. 8p. Order from LC. Mi $1.80, ph $1.80. CF-55-5-34 (Del.)

HRT-CP experimental evaporator studies, by P. A. Haas, J. C. Bresee, and J. K. Langsdon. Oak Ridge National Lab., Tenn. Feb. 1956. Decl. Mar. 14, 1957. Contract W-7405-Eng-26. 35p. Order from LC. Mi $3.00, ph $6.30. CF-56-2-156

Operation of in-pile loop L-4-5 (EE), by F. J. Walter. Oak Ridge National Lab., Tenn. Mar. 1956. Decl. Feb. 8, 1957. Contract W-7405-Eng-26. 14p. Order from LC. Mi $2.40, ph $3.30. CF-56-3-16

HRP-CP: Sampler operation and uranium peroxide precipitation in the HRT chemical processing plant, by William L. Carter. Oak Ridge National Lab., Tenn. Apr. 1956. Decl. Mar. 14, 1957. Contract W-7405-Eng-26. 7p. Order from LC. Mi $1.80, ph $1.80. CF-56-4-87

HRP-BP: A mathematical analysis of the HRT blanket processing plant, by William L. Carter. Oak Ridge National Lab., Tenn. July 1956. Decl. Mar. 13, 1957. Contract W-7405-Eng-26. 21p. Order from LC. Mi $2.70, ph $4.80. CF-56-7-49

Darex: HEP design and recommendations, by C. E. Guthrie. Oak Ridge National Lab., Tenn. Aug. 1956. Decl. Mar. 19, 1957. Contract W-7405-Eng-26. 11p. Order from LC. Mi $2.40, ph $3.30. CF-56-8-167

Zircex: HEP design and recommendations, by C. E. Guthrie. Oak Ridge National Lab., Tenn. Oct. 1956. Decl. Mar. 13, 1957. Contract W-7405-Eng-26. 14p. Order from LC. Mi $2.40, ph $3.30. CF-56-10-41

Thorex pilot plant: Bench tests on resin sorption columns for the new uranium isolation system, by J. H. Walker. Oak Ridge National Lab., Tenn. Nov. 1956. Decl. Mar. 12, 1957. Contract W-7405-Eng-26. 15p. Order from LC. Mi $2.40, ph $3.30. CF-56-11-27

Solvent extraction of Pu(IV) by trifluoroacetylacetone, by H. W. Crandall, J. R. Thomas, and J. C. Reid. California. Univ., Berkeley. Radiation Lab. Jan. 1945. Decl. Feb. 19, 1957. Contract W-7405-Eng-48B. 10p. Order from LC. Mi $1.80, ph $1.80. CN-2657

Neutralization of HNO_3 in Redox ICU and IAW streams, by M. H. Curtis. Hanford Works, Richland, Wash. Dec. 1948. Decl. Feb. 26, 1957. 6p. Order from LC. Mi $ 1.80, ph $1.80. HW-11885

Studies of the system: Thorium nitrate, nitric acid, water, tributyl phosphate, and Amsco 125-90W, by W. W. Schulz and E. E. Voiland. Hanford Atomic Products Operation, Richland, Wash. Dec. 1954. Decl. Apr. 1, 1957. Contract W-31-109-Eng-52. 22p. Order from LC. Mi $2.70, ph $4.80. HW-32417

Laboratory studies of the preparation and use of dibasic aluminum nitrate for the "25" process feed adjustment step, by R. B. Lemon. American Cyanamid Co. (Atomic Energy Div.), Idaho Falls, Idaho. Dec. 1952. Decl. with deletions Feb. 27, 1957. 11p. Order from LC. Mi $2.40, ph $3.30. IDO-14204 (Del.)

Operation of underwater test basin. Job 11, detailed project status report -period January 21, 1949 to July 19, 1949. With this is bound an Appendix--KLX-70-A. Kellex Corp., New York. Sept. 1949. Decl. Mar. 4, 1957. Contract AT-30-1-Gen-169. 149p. Order from LC. Mi $7.20, ph $22.80. KLX-70

Homogeneous reactor fuel reprocessing quarterly progress report - January 1-March 31, 1955, by John D. McAdoo, Robert J. Abelson, and Gloria K. Koenig. (Job 1087). Vitro Labs., West Orange, N. J. May 1955. Decl. Feb. 28, 1957. Contract W-7405-Eng-26, subcontract No. 535. 11p. Order from LC. Mi $2.40, ph $3.30. KLX-10000

Quantitative separation of americium and plutonium using cupferron, by J. P. Nigon and R. A. Penneman. Los Alamos Scientific Lab., N. Mex. Mar. 1950. Decl. with deletions Feb. 7, 1957. Contract W-7405-Eng-36. 10p. Order from LC. Mi $1.80, ph $1.80. LA-1079 (Del.)

The polarographic behavior of various metal ions in plutonium solutions, by C. G. Warren. Los Alamos Scientific Lab., N. Mex. July 1953. Decl. with deletions Mar. 14, 1957. Contract W-7405-Eng-36. 26p. Order from LC. Mi $2.70, ph $4.80. LA-1843 (Del.)

Variables affecting solvent extraction and a summary of two cycle hexone extractions employing irradiated U-235, by F. R. Bruce. (Progress report - period Dec. 13, 1946 to May 1, 1947). Clinton Labs., Oak Ridge, Tenn. July 1947. Decl. Mar. 2, 1957. Contract W-35-058-Eng-71. 43p. Order from LC. Mi $3.30, ph $7.80. Mon N-319

Ion exchange resins in separations involving uranium, by G. P. Monet. (Period covered June 1, 1945-September 15, 1946). Clinton Labs., Oak Ridge, Tenn. Nov. 1946. Decl. Mar. 7, 1957. Contract W-7405-Eng-39. 52p. Order from LC. Mi $3.60, ph $9.30. MonT-210

Separation of U^{233} from thorium, by F. L. Steahly. (Progress report - period June 1, 1946 to Mar. 15, 1947). Clinton Labs., Oak Ridge, Tenn. Decl. Mar. 7, 1957. Contract W-35-058-Eng-71. 122p. Order from LC. Mi $6.30, ph $19.80. MonT-253

Oxidation of uranium tetrafluoride in a moving-bed reactor, by H. W. Franz, and R. H. Toye. Union Carbide Nuclear Company, a division of Union Carbide and Carbon Corp. Oak Ridge, Tenn. n. d. Contract W-7405-Eng-26. 32p. Order from OTS. $1.00 ORNL-2409

Criticality Studies

Critical mass study for cylindrical geometry as a function of radius to height ratio, by Robert A. Wier. California Research and Development Co., Livermore, Calif. Jan. 1953. Decl. Mar. 13, 1957. 6p. Order from LC. Mi $1.80, ph $1.80. LWS-24712

Results of two-group three-region criticality calculations done by the National Bureau of Standards on SWAC, by Ralph Balent. North American Aviation, Inc., Downey, Calif. June 1953. Decl. Mar. 27, 1957. Contract AT-11-1-GEN-8. 20p. Order from LC. Mi $2.70, ph $4.80. NAA-SR-Memo-716

Health and Safety

Occupational exposure to thorium and beryllium at Ames Research Laboratory, by Paul B. Klevin. New York Operations Office, AEC. July 1952. Decl. Mar. 12, 1957. 23p. Order from LC. Mi $2.70, ph $4.80. AMES-1

Environmental radioactivity at Argonne National Laboratory, by J. Sedlet. (Report for year 1956). Argonne National Laboratory, Lemont, Ill. January 1958. Contract W-31-109-Eng-38. 38p. Order from OTS. $1.25. ANL-5808

Design of a regional survey program, by J. Henry Horton, Jr. E. I. du Pont de Nemours & Co. Savannah River Laboratory. Augusta, Ga. November 1957. Contract AT(07-2)-1. 21p. Order from OTS. 75 cents. DP-253

Calculations on environmental consequences of reactor accidents, by J. W. Healy. (Interim report). Hanford Atomic Products Operation, Richland, Wash. Dec. 1957. Contract W-31-109-Eng-52. 50p. Order from OTS. $1.50. HW-54128

Estimation of whole body dose (rem) from tritium in body water, by James N. P. Lawrence. Los Alamos Scientific Laboratory of the Univ. of Calif. Los Alamos, N. Mex. Feb. 1958. Contract W-7405-Eng-36. 21p. Order from OTS. 75 cents. LA-2163

Accountability, security and health physics procedures for U^{235} in exponential studies. California Research and Development Co., Livermore Research Lab., Livermore, Calif. Apr. 1953. Decl. Feb. 27, 1957. Contract AT(11-1)-74. 17p. Order from LC. Mi $2.40, ph $3.30. LWS-29061

Radium content of soil, water, food, and humans: Reported values, by S. Allan Lough. New York Operations Office. Health and Safety Lab., AEC. Mar. 1957. 7p. Order from LC. Mi $1.80, ph $1.80. NYO-2077

Fitting linear combinations of exponentials to human uranium-excretion data, by S. R. Bernard and others. Oak Ridge National Lab., Tenn. n. d. Contract W-7405-Eng-26. 18p. Order from OTS. 75 cents. ORNL-2364

Metabolism of indium. II. The distribution and excretion of indium ^{114m} administered to the rat by subcutaneous injection, by Geneva A. Smith and James K. Scott. Rochester, N. Y. Univ. Atomic Energy Project. Aug. 1957. Contract W-7401-Eng-49. 21p. Order from LC. Mi $2.40, ph $3.30. UR-507

Instruments

Thin plastic scintillator fission detector, by V. K. Fischer, E. Nagel, and W. W. Havens, Jr. Columbia Univ., Pupin Cyclotron Lab. and Pegram Lab., New York. Nov. 1956. Contract AT-30-1-GEN-72. 10p. Order from LC. Mi $1.80, ph $1.80. CU-152

A gamma absorptometer for the continuous analysis of solutions of heavy metal salts, by Donald H. Thurnau. E. I. du Pont de Nemours & Co. Savannah River Lab. Augusta, Ga. Nov. 1957. Contract AT(07-2)-1. 31p. Order from OTS. $1.00. DP-249

Preliminary report on the use of the Consolidated Engineering Corporation mass spectrometer, Model 21-120, for the isotopic assay of uranium, by W. E. Duffy, K. M. Heaton, and R. J. Francel. American Cyanamid Co. Atomic Energy Div., Idaho Falls, Idaho. Feb. 1952. Decl. Feb. 25, 1957. Contract AT-(10-1)-177. 29p. Order from LC. Mi $2.70, ph $4.80.
IDO-14048

Nuclear magnetic resonance for field monitoring and control in mass and alpha energy spectrometry, by J. C. Sheffield and F. A. White. General Electric Company. Knolls Atomic Power Lab., Schenectady, N. Y. July 1957. Contract W-31-109-Eng-52. 16p. Order from OTS. 75 cents.
KAPL-1840

S3G instrument tube mock-up tests, by W. P. Walsh. Knolls Atomic Power Lab., Schenectady, N. Y. Nov. 1957. Contract W-31-109-Eng-52. 24p. Order from LC. Mi $2.70, ph $4.80.
KAPL-M-WPW-1

A ball holder for coating operations, by James R. Lilienthal. Los Alamos Scientific Lab., N. Mex. Apr. 1953. Decl. Apr. 1, 1957. Contract W-7405-Eng-36. 12p. Order from LC. Mi $2.40, ph $3.30.
LA-1564

Special applications of quartz fibers - the fabrication and use of microtubing and helices, by M. I. Gray and R. G. Olt. Mound Laboratory. Monsanto Chemical Co. Miamisburg, Ohio. n. d. Contract AT 33-1-GEN-53. 15p. Order from OTS. 50 cents.
MLM-1024

Metallurgy and Ceramics

Developments in cutting and machining uranium at the Iowa State College Laboratory, by C. F. Gray. Ames Lab., Ames, Iowa. Jan. 1946. Decl. Feb. 13, 1957. 31p. Order from LC. Mi $3.00, ph $6.30.
A-4048

An investigation of metal shells as cushioning devices for the component recovery program, by W. D. LaCoss. Sandia Corp., Albuquerque, N. Mex. Mar. 1957. 10p. Order from LC. Mi $1.80, ph $1.80.
AECU-3441

Metallurgy Division report for January, February, and March 1949. Argonne National Lab., Lemont, Ill. Mar. 1949. Decl. with deletions Mar. 11, 1957. Contract W-31-109-Eng-38. 96p. Order from LC. Mi $5.40, ph $15.30.
ANL-4316 (Del.)

Preliminary report on low columbium: Uranium corrosion resistant alloys, by J. E. Draley. Argonne National Lab., Lemont, Ill. June 1953. Decl. Apr. 2, 1957. Contract W-31-109-Eng-38. 9p. Order from LC. Mi $1.80, ph $1.80.
ANL-5078

Fabrication of fuel subassemblies for the Borax-III reactor, by David E. Walker and Robert A. Noland. Argonne National Lab., Lemont, Ill. Jan. 1958. Contract W-31-109-Eng-38. 35p. Order from OTS. $1.00.
ANL-5559

Irradiation of uranium-fissium alloys and related compositions, by K. F. Smith. Argonne National Lab., Lemont, Ill. Sept. 1957. Contract W-31-109-Eng-38. 55p. Order from OTS. $1.50.
ANL-5736

Creep strength of uranium alloys at 1500 and 1800F., by H. A. Saller and others. Battelle Memorial Inst., Columbus, Ohio. May 1953. Decl. Feb. 14, 1957. Contract W-7405-Eng-92. 30p. Order from LC. Mi $2.70, ph $4.80.
BMI-834

Properties of stainless steel-uranium dioxide fuel plates, by J. R. Keeler and L. J. Cuddy. Battelle Memorial Inst., Columbus, Ohio. May 1954. Decl. Mar. 6, 1957. Contract W-7405-Eng-92. 16p. Order from LC. Mi $2.40, ph $3.30.
BMI-913 (Del.)

Progress relating to civilian applications during April, 1956, by Russell W. Dayton and Clyde R. Tipton, Jr. Battelle Memorial Inst., Columbus, Ohio. May 1956. Decl. with deletions Feb. 13, 1957. Contract W-7405-Eng-92. 82p. Order from LC. Mi $4.50, ph $12.30.
BMI-1088 (Del.)

Progress relating to civilian applications during May, 1956, by Russell W. Dayton and Clyde R. Tipton, Jr. Battelle Memorial Inst., Columbus, Ohio. June 1956. Decl. with deletions Feb. 13, 1957. Contract W-7405-Eng-92. 86p. Order from LC. Mi $4.80, ph $13.80.
BMI-1094 (Del.)

Progress relating to civilian applications during September, 1956, by Russell W. Dayton and Clyde R. Tipton, Jr. Battelle Memorial Inst., Columbus, Ohio. Oct. 1956. Decl. with deletions Mar. 12, 1957. Contract W-7405-Eng-92. 69p. Order from LC. Mi $3.90, ph $10.80.
BMI-1136 (Del.)

The effect of primary alpha on the beta decomposition of zirconium-uranium-oxygen alloys, by David L. Douglass and Lyle L. Marsh, Jr. Battelle Memorial Inst. Columbus, Ohio. Jan. 1958. Contract W-7405-Eng-92. 19p. Order from OTS. 75 cents. BMI-1249

HRP dynamic corrosion studies, by J. C. Griess, R. S. Greeley, and S. R. Buxton. Oak Ridge National Lab., Tenn. Jan. 1956. (Summary of run L-33). Decl. Mar. 13, 1957. Contract W-7405-Eng-26. 10p. Order from LC. Mi $1.80, ph $1.80. CF-56-1-54

HRP dynamic corrosion studies, by J. C. Griess, R. S. Greeley, and S. R. Buxton. (Summary of run I-30). Oak Ridge National Lab., Tenn. Jan. 1956. Decl. Mar. 13, 1957. Contract W-7405-Eng-26. 10p. Order from LC. Mi $1.80, ph $1.80. CF-56-1-155

HRP dynamic corrosion studies. Summary of run D-62: 2.7m UO_2SO_4 plus 3.0m Li_2SO_4 at 200°C, by J. C. Griess, R. S. Greeley, and S. R. Buxton. Oak Ridge National Lab., Tenn. Feb. 1956. Decl. Mar. 16, 1957. Contract W-7405-Eng-26. 6p. Order from LC. Mi $1.80, ph $1.80. CF-56-2-39

Summary of toroid run No. 84. Type 347 stainless steel, titanium 75A and Zircaloy-2 in uranyl sulfate at 250°C and 25 fps. The effect in lithium sulfate, by G. E. Moore. Oak Ridge National Lab., Tenn. Feb. 1956. Decl. Mar. 16, 1957. Contract W-7405-Eng-26. 8p. Order from LC. Mi $1.80, ph $1.80. CF-56-2-140

Brazing of aluminum bronze to Inconel, by D. Caplan, J. J. McCarthy, and E. F. Nippes. Rensselaer Polytechnic Inst., Troy, N. Y. (Progress report - September 15, 1955 to February 1, 1956). Feb. 1956. Contract W-7405-Eng-26. 27p. Order from LC. Mi $2.70, ph $4.80. CF-56-2-170

Metallographic examination of glassed titanium specimens, by M. L. Picklesimer. Oak Ridge National Lab., Tenn. May 1956. Contract W-7405-Eng-26. 7p. Order from LC. Mi $1.80, ph $1.80. CF-56-5-141

HRP dynamic solution corrosion studies - quarter ending July 31, 1956, by J. C. Griess and others. Oak Ridge National Lab., Tenn. July 1956. Decl. Mar. 13, 1957. Contract W-7405-Eng-26. 50p. Order from LC. Mi $3.30, ph $7.80. CF-56-7-52

Trip to the Bureau of Mines, Albany, Oregon, regarding rare earth alloy development, by C. F. Leitten, Jr. Oak Ridge National Lab., Tenn. Nov. 1956. Decl. Mar. 13, 1957. Contract W-7405-Eng-26. 5p. Order from LC. Mi $1.80, ph $1.80. CF-56-11-29

Metallurgy of tuballoy (uranium). Progress report. Battelle Memorial Inst., Columbus, Ohio. Aug. 1944. Decl. Feb. 19, 1957. 23p. Order from LC. Mi $2.70, ph $4.80. CT-2002

Progress report for the month of August 1945. Massachusetts Inst. of Tech., Cambridge, Mass. Sept. 1945. Decl. Feb. 20, 1957. Contract W-7405-Eng-175. 16p. Order from LC. Mi $2.40, ph $3.30. CT-3229

Corrosion of steel by hydrogen sulfide, by J. C. Rowell. (Progress report - September 15-December 11, 1952). E. I. du Pont de Nemours & Co. Experimental Station, Wilmington, Dela. Jan. 1953. Decl. Mar. 20, 1957. 17p. Order from LC. Mi $2.40, ph $3.30. ESP-52-351

Interim report on examination of powder metallurgy slug from PT-105-313-4M, by D. P. O'Keefe. Hanford Works, Richland, Wash. Jan. 1953. Decl. with deletions Feb. 28, 1957. Contract W-31-109-Eng-52. 9p. Order from LC. Mi $1.80, ph $1.80. HW-26692 (Del.)

Corrosion of 2-S aluminum in potassium tetraborate solution, by N. R. Miller. Hanford Works, Richland, Wash. Jan. 1953. Decl. Feb. 28, 1957. Contract W-31-109-Eng-52. 7p. Order from LC. Mi $1.80, ph $1.80. HW-26928

Static corrosion tests of fabrication material for D-12 waste evaporator, by D. F. Shepard. General Electric Co. Hanford Atomic Products Operation, Richland, Wash. June 1953. Decl. Feb. 20, 1957. Contract W-31-109-Eng-52. 8p. Order from LC. Mi $1.80, ph $1.80. HW-28491

Aluminum can quality, by R. S. Dalrymple. General Electric Co. Hanford Atomic Products Operation, Richland, Wash. Aug. 1954. Decl. Apr. 4, 1957. Contract W-31-109-Eng-52. 10p. Order from LC. Mi $1.80, ph $1.80. HW-32801

Controlled oxidation of plutonium metal turnings, by Robert C. Smith and D. Ross Doman. General Electric Co. Hanford Atomic Products Operation, Richland, Wash. Nov. 1955. Decl.

Mar. 29, 1957. Contract W-31-109-Eng-52. 2p. Order from LC. Mi $1.80, ph $1.80. HW-39880

Effects of carbon content on the rate of dissolution of dingot uranium in nitric acid, by A. L. Bement and J. L. Swanson. General Electric Co. Hanford Atomic Products Operation, Richland, Wash. Nov. 1957. Contract W-31-109-Eng-52. 20p. Order from OTS. 75 cents. HW-52430

High temperature aqueous corrosion product films on aluminum, by V. H. Troutner. General Electric Co. Hanford Atomic Products Operation, Richland, Wash. Nov. 1957. Contract W-31-109-Eng-52. 38p. Order from OTS. $1.25. HW-53389

Progress report in metallurgy. Ames Lab., Ames, Iowa. Aug. 1948. Decl. Mar. 27, 1957. Contract W-7405-Eng-82. 31p. Order from LC. Mi $3.00, ph $6.30. ISC-25

Quarterly summary research report - April, May, and June 1954, by P. Chiotti and O. N. Carlson, comps. Ames Lab., Ames, Iowa. Sept. 1954. Decl. with deletions Feb. 26, 1957. Contract W-7405-Eng-82. 31p. Order from LC. Mi $3.00, ph $6.30. ISC-507 (Del.)

Effect of cyclic strain on the fatigue resistance of alpha-rolled uranium, by L. F. Coffin, Jr. Knolls Atomic Power Lab., Schenectady, N. Y. Nov. 1953. Decl. with deletions Feb. 25, 1957. Contract W-31-109-Eng-52. 18p. Order from LC. Mi $2.40, ph $3.30. KAPL-1019 (Del.)

Metallurgy report of the Technical Department - December 1955, January, February 1956, by C. A. Bruch, W. M. Cashin, and D. W. White. Knolls Atomic Power Lab., Schenectady, N. Y. Decl. with deletions Feb. 25, 1957. Contract W-31-109-Eng-52. 29p. Order from LC. Mi $2.70, ph $4.80. KAPL-1526 (Del.)

The fast oxide breeder - sintering studies of PuO_2-UO_2, by J. N. Frank. General Electric Co. Knolls Atomic Power Lab., Schenectady, N. Y. July 1957. Contract W-31-109-Eng-52. 26p. Order from OTS. 75 cents. KAPL-1837

A literature survey of mechanical and physical properties of annealed Zircaloy-2, by A. R. Kephart. Knolls Atomic Power Lab., Schenectady, N. Y. Oct. 1957. Contract W-31-109-Eng-52. 53p. Order from LC. Mi $3.60, ph $9.30. KAPL-M-ARK-1

Metallurgical examination of calrod heater failure: Test calrod No. 4, by C. F. Barrett, Jr. Knolls Atomic Power Lab., Schenectady, N. Y. Aug. 1957. Contract W-31-109-Eng-52. 18p. Order from LC. Mi $2.40, ph $3.30. KAPL-M-CFB-2

Evaluation of seal weld joint designs, by D. B. Kittle. Knolls Atomic Power Lab., Schenectady, N. Y. Jan. 1957. Contract W-31-109-Eng-52. 8p. Order from LC. Mi $1.80, ph $1.80. KAPL-M-DBK-2

Evaluation of seal weld joint designs, by K. H. Koopman and D. B. Kittle. Knolls Atomic Power Lab., Schenectady, N. Y. Mar. 1957. Contract W-31-109-Eng-52. 14p. Order from LC. Mi $2.40, ph $3.30. KAPL-M-DBK-2 (Suppl.1)

Development of procedures for internal butt welding of T347 stainless steel tubes to tube sheets, by D. B. Kittle, K. H. Koopman, and J. M. Gerken. Knolls Atomic Power Lab., Schenectady, N. Y. Nov. 1957. Contract W-31-109-Eng-52. 18p. Order from LC. Mi $2.40, ph $3.30. KAPL-M-DBK-4

An evaluation of the KAPL 3 x 3 ETR in-pile tube design, by H. E. Barrie. Knolls Atomic Power Lab., Schenectady, N. Y. Aug. 1957. Contract W-31-109-Eng-52. 39p. Order from LC. Mi $3.00, ph $6.30. KAPL-M-HEB-1

Corrosion resistance and coatings for corrosion protection of AISI 410 steel, by Henry Suss. Knolls Atomic Power Lab., Schenectady, N. Y. Jan. 1956. Contract W-31-109-Eng-52. 12p. Order from LC. Mi $2.40, ph $3.30. KAPL-M-HOS-2

Corrosion studies of crystal bar zirconium in organic coolants, by J. G. Gratton. Knolls Atomic Power Lab., Schenectady, N. Y. Oct. 1956. Contract W-31-109-Eng-52. 10p. Order from LC. Mi $1.80, ph $1.80. KAPL-M-JGG-1

Investigation of cracking tendency of welded Timken 16-25-6 alloy, by J. M. Gerken, R. J. Flint, and D. B. Kittle. Sept. 1957. Contract W-31-109-Eng-52. 9p. Order from LC. Mi $1.80, ph $1.80. KAPL-M-JMG-12

The physical properties of U-Be alloys, by L. R. McCreight. Knolls Atomic Power Lab., Schenectady, N. Y. Jan. 1954. Decl. Mar. 13, 1957. Contract W-31-109-Eng-52. 6p. Order from LC. Mi $1.80, ph $1.80. KAPL-M-LRM-12

Statistical procedure for determination of homogeneity of U-Zr fuel plates for use in D1G-CWA, by R. J. Allio. Knolls Atomic Power Lab., Schenectady, N. Y. Oct. 1957. Contract W-31-109-Eng-52. 10p. Order from LC. Mi $1.80, ph $1.80. KAPL-M-RJA-1

Strain fatigue behavior of Zircaloy 2 and 3 at room temperature and 550°F, by R. L. Mehan and others. Knolls Atomic Power Lab., Schenectady, N. Y. Nov. 1957. Contract W-31-109-Eng-52. 21p. Order from LC. Mi $2.70, ph $4.80. KAPL-M-RLM-13

Tungsten-arc spot welding of stainless steel staking pins into dowel pins for S3G unit cell, by S. A. Toftegaard. Knolls Atomic Power Lab., Schenectady, N. Y. Aug. 1957. Contract W-31-109-Eng-52. 9p. Order from LC. Mi $1.80, ph $1.80. KAPL-M-SAT-5

Fabrication of samples for critical assembly tests, by W. E. Ray. Knolls Atomic Power Lab., Schenectady, N. Y. June 1957. Contract W-31-109-Eng-52. 29p. Order from LC. Mi $2.70, ph $4.80. KAPL-M-WER-4

Impact extrusion of uranium, by G. S. Hanks and others. Los Alamos Scientific Lab., N. Mex. Jan. 1951. Decl. Mar. 26, 1957. Contract W-7405-Eng-36. 50p. Order from LC. Mi $3.30, ph $7.80. LA-1202

Technical progress report for period April through June 1950. Massachusetts Inst. of Tech., Cambridge. Metallurgical project. Sept. 1950. Decl. Feb. 26, 1957. Contract W-7405-Eng-175. 17p. Order from LC. Mi $ 2.40, ph $3.30. MIT-1052 (Pt. II)

Dow-Detroit Edison project progress report, July 1 to October 1, 1954, by R. O. Evans and A. Boltax. Nuclear Metals, Inc., Cambridge, Mass. Nov. 1954. Decl. Mar. 22, 1957. Contract AT(30-1)-1565. 32p. Order from LC. Mi $3.00, ph $6.30. NMI-1121

Fundamental and applied research and development in metallurgy. Progress report for November 1954. Nuclear Metals, Inc., Cambridge, Mass. Nov. 1954. Decl. Feb. 28, 1957. Contract AT (30-1)-1565. 7p. Order from LC. Mi $1.80, ph $1.80. NMI-2028

Extrusion-preliminary evaluation, by A. F. Steeves. Westinghouse Electric Corp. Bettis Plant, Pittsburgh, Penna. Mar. 1957. Contract AT-11-1-GEN-14. 4p. Order from LC. Mi $1.80, ph $1.80. WAPD-A1W (FE)-291

Creep properties of annealed unalloyed zirconium, by M. J. Manjoine and W. L. Mudge, Jr. Westinghouse Electric Corp. Atomic Power Div., Pittsburgh, Penna. Dec. 1953. Changed from Official Use Only Apr. 2, 1954. 44p. Order from LC. Mi $3.30, ph $7.80. WAPD-T-167

Melting and fabrication of iodide nafnium, by J. G. Goodwin and W. J. Hurford. Westinghouse Electric Corp. Atomic Power Div., Pittsburgh Penna. Feb. 1955. 40p. Order from LC. Mi $3.00, ph $6.30. WAPD-T-198

Particle Accelerators and High-Voltage Machines

Mark I MTA linear accelerator run No. 1, by R. J. Vetterlein. California Research and Development Co. Livermore Research Lab., Livermore, Calif. Nov. 1953. Decl. Apr. 5, 1957. Contract AT(11-1)-74. 13p. Order from LC. Mi $2.40, ph $3.30. LRL-67

Mark I MTA linear accelerator run No. 5, by P. V. Livdahl and R. J. Vetterlein. California Research and Development Co., Livermore Research Lab., Livermore, Calif. Jan. 1954. Decl. Mar. 29, 1957. Contract AT(11-1)-74. 14p. Order from LC. Mi $2.40, ph $3.30. LRL-81

Mark I MTA linear accelerator run No. 7, by S. P. Stone and R. J. Vetterlein. California Research and Development Co. Livermore Research Lab. Livermore, Calif. Mar. 1954. Decl. Mar. 29, 1957. Contract AT(11-1)-74. 17p. Order from LC. Mi $2.40, ph $3.30. LRL-90

Mark I MTA linear accelerator run No. 9, by R. J. Vetterlein. California Research and Development Co. Livermore Research Lab., Livermore, Calif. Mar. 1954. Decl. Apr. 5, 1957. Contract AT(11-1)-74. 7p. Order from LC. Mi $1.80, ph $1.80. LRL-92

Mark I MTA linear accelerator run No. 10, by D. H. Birdsall. California Research and Development Co. Livermore Research Lab., Livermore, Calif. Feb. 1954. Decl. Mar. 4, 1957. Contract AT(11-1)-74. 50p. Order from LC. Mi $3.30, ph $7.80. LRL-93

Status of the MTA process. California Research and Development Co. Livermore Research Lab. Livermore, Calif. Feb. 1954. Decl. with deletions Feb. 27, 1957. Contract AT(11-1)-74. 115p. Order from LC. Mi $6.00, ph $18.30. LRL-102 (Del.)

Operation of a high current RF injector for an MTA-type accelerator, by W. A. S. Lamb. California Research and Development Co. Livermore Research Lab., Livermore, Calif. May 1954. Decl. Feb. 28, 1957. Contract AT (11-1)-74. 15p. Order from LC. Mi $2.40, ph $3.30. LRL-114

The MTA Mark I accelerator RF system, by S. P. Stone. California Research and Development Co. Livermore Research Lab., Livermore, Calif. May 1954. Decl. Mar. 25, 1957. Contract AT(11-1)-74. 35p. Order from LC. Mi $3.00, ph $6.30. LRL-123

Preliminary study of helium cooled, flat plate uranium primary target, by M. F. Katzer. California Research and Development Co., Livermore, Calif. Sept. 1952. Decl. Apr. 5, 1957. 13p. Order from LC. Mi $2.40, ph $3.30. LWS-24589

Accountability, security, and health physics procedures for Pu^{239} in exponential studies. California Research and Development Co. Livermore Research Lab., Livermore, Calif. Apr. 1953. Decl. Feb. 27, 1957. Contract AT(11-1)-74. 17p. Order from LC. Mi $2.40, ph $3.30. LWS-29063

Performance of cavity type production lattices for MTA, by W. J. Houghton and E. R. Cohen. North American Aviation, Inc., Downey, Calif. Apr. 1952. Decl. with deletions Feb. 26, 1957. Contract AT-11-1-GEN-8. 95p. Order from LC. Mi $5.70, ph $16.80. NAA-SR-166 (Del.)

A square-wave cyclotron oscillator, by C. D. Goodman. Oak Ridge National Lab., Tenn. n. d. Contract W-7405-Eng-26. 58p. Order from OTS. $1.75. ORNL-2403

Physics and Mathematics

Distribution-free tolerance limits, by D. B. Owen. Sandia Corp., Albuquerque, N. Mex. Mar. 1957. Contract AT(29-1)-789. 12p. Order from LC. Mi $2.40, ph $3.30. AECU-3451

Coincidence techniques for cyclotron experiments, by J. A. Northrop, R. H. Stokes, and Keith Boyer. Los Alamos Scientific Lab., N. Mex. (1957). Contract W-7405-Eng-36. 4p. Order from LC. Mi $1.80, ph $1.80. AECU-3452

Summary report of UNM studies of accuracy in calculating arithmetical problems, by P. F. Meigs. Sandia Corp., Albuquerque, N. Mex. May 1957. Contract AT(29-1)-789. 13p. Order from LC. Mi $2.40, ph $3.30. AECU-3480

Measurement of the velocity of sound in a liquid containing gas bubbles, by Henry B. Karplus. (Technical report No. 1). Illinois Inst. of Tech., Chicago. Armour Research Foundation. Feb. 1957. Project No. A-097. Contract AT(11-1)-527. 19p. Order from LC. Mi $2.40, ph $3.30. AECU-3489

Wind and position variability from rawijet data, by Jack W. Reed and T. E. VanZandt. Sandia Corp. Albuquerque, N. Mex. Mar. 1957. Contract AT (29-1)-789. 25p. Order from LC. Mi $2.70, ph $4.80. AECU-3492

An analog fallout computer, by H. B. Durham. Sandia Corp., Albuquerque, N. Mex. Nov. 1956. Contract AT(29-1)-789. 11p. Order from LC. Mi $1.80, ph $1.80. AECU-3495

Convection heat transfer and fluid flow in ducts, by Leonard Topper. Columbia Univ., New York. Mar. 1957. (For Knolls Atomic Power Lab.). Contract AT(30-3)-187, Task V. 126p. Order from LC. Mi $6.30, ph $19.80. AECU-3501

Feedback logic circuits, by G. R. Bussey. Sandia Corp., Albuquerque, N. Mex. May 1957. Contract AT(29-1)-789. 14p. Order from LC. Mi $2.40, ph $3.30. AECU-3502

Technical progress report. Part I. Study program on high-speed computer. Part II. Switching circuit theory. Part III. Mathematical methods. Part IV. Illiac use and operation--general laboratory information. Illinois. Univ., Urbana. Digital Computer Lab. Apr. 1957. Contracts AT(11-1)-415; N6ori-07130; and Nonr-1834(15). 19p. Order from LC. Mi $2.40, ph $3.30. AECU-3503

Technical progress report. Part I. Study program on high-speed computer. Part II. Switching circuit theory. Part III. Mathematical methods. Part IV. Illiac use and operation--general laboratory information. Illinois. Univ., Urbana. Digital Computer Lab. May 1957. Contracts AT(11-1)-415; N6ori-07130; and Nonr-1834(15). 17p. Order from LC. Mi $2.40, ph $3.30. AECU-3508

Point source explosion in air, by Harold L. Brode. Rand Corp., Santa Monica, Calif. Dec. 1956. Contract AT(29-1)-1477. 85p. Order from LC. Mi $4.80, ph $13.80. AECU-3517

Free convection heat transfer to a horizontal cylinder from an ordinary fluid containing a volume heat source (thesis), by Isaac Eric Randall. Purdue Research Foundation, Lafayette, Ind. Aug. 1957. Contract AT(11-1)-432. 69p. Order from LC. Mi $4.50, ph $12.30. AECU-3523

Some measurements of acceleration produced by sound pressures, by Charles W. Remaley. Sandia Corp., Albuquerque, N. Mex. July 1957. Contract AT(29-1)-789. 23p. Order from LC. Mi $2.70, ph $4.80. AECU-3541

Low pressure transport through porous media, by W. H. Eberhardt and R. B. Bernstein. Oak Ridge Gaseous Diffusion Plant, Tenn. Oct. 1956. Contract W-7405-Eng-26. 20p. Order from LC. Mi $2.40, ph $3.30. AECU-3550

A proposal for a generalized card key punch, by E. A. Voorhees. Los Alamos Scientific Lab., N. Mex. July 1956. Contract W-7405-Eng-36. 12p. Order from LC. Mi $2.40, ph $3.30. AECU-3553

Calculation of parameters for low pressure gas liquefaction cycles, by Howard O. McMahon and Gerald H. Golden. Little (Arthur D.) Inc., Cambridge, Mass. and Cambridge Corp., Cambridge, Mass. Mar. 1953. Contract AT(29-1)-1322. 186p. Order from LC. Mi $8.40, ph $28.80. AECU-3558

Free convection heat transfer to horizontal cylinders from an ordinary fluid containing a volume heat source, (thesis, January 1958), by Jose Pineda de Guzman. Purdue Univ., Lafayette, Ind. Contract AT(11-1)-432. 101p. Order from LC. Mi $5.70, ph $16.80. AECU-3579

Temperature distribution in a metal cylinder, by David W. Whitcombe. Oak Ridge National Lab., Tenn. Sept. 1950. Decl. Feb. 13, 1957. Contract W-7405-Eng-26. 7p. Order from LC. Mi $1.80, ph $1.80. CF-50-9-117

A method for the preliminary analysis of percolation data, by S. H. Jury. Oak Ridge National Lab., Tenn. Nov. 1950. Decl. Feb. 13, 1957. Contract W-7405-Eng-26. 5p. Order from LC. Mi $1.80, ph $1.80. CF-50-11-121

Variation of breeding ratio with thorium blanket concentration in a two-region thermal breeder, by Melvin Tobias. Oak Ridge National Lab., Tenn. Sept. 1953. Decl. Feb. 14, 1957. Contract W-7405-Eng-26. 5p. Order from LC. Mi $1.80, ph $1.80. CF-53-9-30

Concentrated salt solutions for reactor fuel media or heat exchanger fluids, by C. H. Secoy. Oak Ridge National Lab., Tenn. May 1956. Decl. Mar. 13, 1957. Contract W-7405-Eng-26. 10p. Order from LC. Mi $1;80, ph $1.80. CF-56-5-24

Maximum temperature in thin rectangular uranium wafers, by C. R. McNutt. Hanford Atomic Products Operation, Richland, Wash. Jan. 1954 Decl. Mar. 13, 1957. Contract W-31-109-Eng-52. 5p. Order from LC. Mi $1.80, ph $1.80. HW-30451

Temperature coefficient of a graphite-uranium lattice, by R. C. Lloyd and C. R. Richey. General Electric Co. Hanford Atomic Products Operation, Richland, Wash. June 1957. Decl. Nov. 7, 1957. Contract W-31-109-Eng-52. 29p. Order from LC. Mi $2.70, ph $4.80. HW-51008

The problem of Knudsen flow. Part III. Solutions for one-dimensional systems, (Addendum), by W. C. DeMarcus. Oak Ridge Gaseous Diffusion Plant, Tenn. Sept. 1957. Contract W-7405-Eng-26. 7p. Order from LC. Mi $1.80, ph $1.80. K-1302(Pt. 3 (Add.))

The problem of Knudsen flow. Part VI. Tortuosity, by W. C. DeMarcus and H. B. Jenkins, Jr. Oak Ridge Gaseous Diffusion Plant, Tenn. Sept. 1957. Contract W-7405-Eng-26. 14p. Order from LC. Mi $2.40, ph $3.30. K-1302(Pt. VI)

Concerning the multigroup diffusion operator, by M. A. Martino. General Electric Co. Knolls Atomic Power Lab., Schenectady, N. Y. Sept. 1957. Contract W-31-109-Eng-52. 14p. Order from OTS. 50 cents. KAPL-1867

Hydrogenous moderator measurements in the ACME and PMA, by A. L. MacKinney. Knolls Atomic Power Lab., Schenectady, N. Y. July 1957. Contract W-31-109-Eng-52. 16p. Order from LC. Mi $2.40, ph $3.30. KAPL-M-ALM-4

Theory of pulsed neutron reactivity measurements in heterogeneous reactors, by B. E. Simmons. Knolls Atomic Power Lab., Schenectady, N. Y. July 1957. Contract W-31-109-Eng-52. 5p. Order from LC. Mi $1.80, ph $1.80. KAPL-M-BES-3

Use of IBM-650 in reduction of foil counting data, by E. B. Fehr. Knolls Atomic Power Lab., Schenectady, N. Y. Jan. 1955. Contract W-31-109-Eng-52. 19p. Order from LC. Mi $2.40, ph $3.30. KAPL-M-EBF-6

A comparison of WOXX, WOX-2 and WOX-3, KAPL 3-group Macroscopic Cross Section codes for the IBM 704, by Elizabeth L. VanDriesen. Knolls Atomic Power Lab., Schenectady, N. Y. Aug. 1957. Contract W-31-109-Eng-52. 27p. Order from LC. Mi $2.70, ph $4.80. KAPL-M-EVD-1

Long term reactivity changes in medium enrichment reactors, by F. C. Merriman. Knolls Atomic Power Lab., Schenectady, N. Y. July 1957. Contract W-31-109-Eng-52. 35p. Order from LC. Mi $3.00, ph $6.30. KAPL-M-FCM-1

TOPSY, a 2-dimensional multi-group program for the UNIVAC. Part I. Output (materials specification), by J. A. Archibald, Jr. Knolls Atomic Power Lab., Schenectady, N. Y. July 1956. Contract W-31-109-Eng-52. 7p. Order from LC. Mi $1.80, ph $1.80. KAPL-M-JA-2

An equation of state involving the critical ratio, by Leo F. Epstein. Knolls Atomic Power Lab., Schenectady, N. Y. May 1956. Contract W-31-109-Eng-52. 8p. Order from LC. Mi $1.80, ph $1.80. KAPL-M-LFE-17

Leakage flows, (contains data for estimating core by-pass leakages and flow losses from penetrations in the pressure containing system), by H. F. Larkin. Knolls Atomic Power Lab., Schenectady, N. Y. Aug. 1957. Contract W-31-109-Eng-52. 19p. Order from LC. Mi $2.40, ph $3.30. KAPL-M-RES-40

Measurement techniques for plenum mixing, time constants, and flow distribution, by H. F. Larkin. Knolls Atomic Power Lab., Schenectady, N. Y. July 1957. Contract W-31-109-Eng-52. 9p. Order from LC. Mi $1.80, ph $1.80. KAPL-M-RES-47

Calculation of the neutron age in hydrogenous mixtures, by R. W. Deutsch and I. A. Podhorez. Knolls Atomic Power Lab., Schenectady, N. Y. (1955?). Contract W-31-109-Eng-52. 12p. Order from LC. Mi $2.40, ph $3.30. KAPL-M-RWD-13

The neutron absorption cross section of Xe^{135}, by R. W. Deutsch. Knolls Atomic Power Lab., Schenectady, N. Y. July 1956. Contract W-31-109-Eng-52. 11p. Order from LC. Mi $1.80, ph $1.80. KAPL-M-RWD-15

Preliminary nuclear analysis of stainless steel water cores, by R. W. Deutsch and J. T. Daley, Jr. Knolls Atomic Power Lab., Schenectady, N. Y. (Feb. 1957). Contract W-31-109-Eng-52. 9p. Order from LC. Mi $1.80, ph $1.80. KAPL-M-RWD-18

Results of the 360°, full scale, water flow test of the top of the KAPL reactor with hold-down plate No. 2, by R. W. Lockhart and R. G. Kennison. Knolls Atomic Power Lab., Schenectady, N. Y. Sept. 1949. Decl. May 9, 1957. Contract W-31-109-Eng-52. 10p. Order from LC. Mi $1.80, ph $1.80. KAPL-M-RWL-4

A steady state dynamic analysis of the S3G/S4G natural circulation steam generator system, by J. C. Westmoreland. Knolls Atomic Power Lab., Schenectady, N. Y. Jan. 1956. Contract W-31-109-Eng-52. 32p. Order from LC. Mi $3.00, ph $6.30. KAPL-M-SMS-13

Thermal stresses in lower pressurizer walls during a cold startup, by Sam H. Davis. Knolls Atomic Power Lab., Schenectady, N. Y. Contract W-31-109-Eng-52. n. d. 22p. Order from LC . Mi $2.70, ph $4.80. KAPL-M-SMS-58

Power plant coolant technology program, by S. L. Williams. Knolls Atomic Power Lab., Schenectady, N. Y. July 1957. Contract W-31-109-Eng-52. 17p. Order from LC. Mi $2.40, ph $3.30. KAPL-M-SMS-74

Decontamination of the S3G/S4G steam generators, by F. C. Steiner. Knolls Atomic Power Lab., Schenectady, N. Y. Nov. 1957. Contract W-31-109-Eng-52. 14p. Order from LC. Mi $2.40, ph $3.30. KAPL-M-SMS-88

A guide to the solution of vibration and shock problems, by Sam W. Tagart. Knolls Atomic Power Lab., Schenectady, N. Y. May 1957. Contract W-31-109-Eng-52. 78p. Order from LC. Mi $4.50, ph $12.30. KAPL-M-SWT-1

Hydraulic flow transients, by Thomas W. Trout. Knolls Atomic Power Lab., Schenectady, N. Y. July 1957. Contract W-31-109-Eng-52. 24p. Order from LC. Mi $2.70, ph $4.80. KAPL-M-TWT-1

Optimization of rocket orbits. Part I. Idealized calculations, by Kenneth W. Ford. Los Alamos Scientific Laboratory of the University of California. Los Alamos, N. Mex. Feb. 1958. Contract W-7405-Eng-36. 32p. Order from OTS. $1.00. LA-2166

Particle-in-cell method for two-dimensional hydrodynamic problems, by Francis H. Harlow, Martha W. Evans, and David E. Harris, Jr. Los Alamos Scientific Lab., N. Mex. Aug. 1956. Contract W-7405-Eng-36. 65p. Order from LC. Mi $3.90, ph $10.80. LAMS-2082

Summary of heat conduction equations for slabs, rods, spheres, and tubes. Steady state, transient, and periodic steady state with uniform heat generation within the solid, by N. C. Ostrander. California Research and Development Co., Berkeley, Calif. Mar. 1951. Decl. Feb. 26, 1957. 19p. Order from LC. Mi $2.40, ph $3.30. LRL-14

The neutrino, by L. B. Borst. Clinton Labs., Oak Ridge, Tenn. Jan. 1945. Decl. Mar. 18, 1957. 10p. Order from LC. Mi $2.40, ph $3.30. N-1886

Control problem and the critical size of an enriched, BeO moderated pile, by A. V. Martin. Chicago. Univ. Metallurgical Lab. May 1946. Decl. Mar. 4, 1957. 9p. Order from LC. Mi $1.80, ph $1.80. N-2281

Mathematical analysis of differential equations arising in the fast reactor safety study, by H. V. Waldinger. Nuclear Development Associates, Inc., White Plains, N. Y. Nov. 1954. 26p. Order from LC. Mi $2.70, ph $4.80. NDA-14-58

Physics Division progress report for the quarter, June, July and August 1948. Oak Ridge National Lab., Tenn. Decl. Mar. 20, 1957. Contract W-7405-Eng-26. 124p. Order from LC. Mi $6.30, ph $19.80. ORNL-159

AEC and contractor source and special materials management representatives meeting. A conference held at Washington, D. C., June 17-19, 1957. Division of Nuclear Materials Management, AEC. Washington, D. C. December 1957. 151p. Order from OTS. $3.00. TID-7541 (Pt. 1)

Three group equations for a multiplying medium, by F. L. Adelman. California. Univ., Berkeley. Radiation Lab. June 1952. Decl. Mar. 22, 1957. Contract W-7405-Eng-48. 2p. Order from LC. Mi $1.80, ph $1.80. UCRL-1855

f, p, and ϵ measurements on 0.600 inch diameter, 1.3% enriched, low density UO_2-fueled TRX lattices, by A. Z. Kranz and G. G. Smith. Westinghouse Electric Corp. Bettis Plant, Pittsburgh, Penna. May 1956. 9p. Order from LC. Mi $1.80, ph $1.80. WAPD-PWR-Ph-105

Fission gas pressures within PWR core 1 fuel rods and proposed PWR core 2 fuel elements. Westinghouse Electric Corp. Atomic Power Div., Pittsburgh, Penna. Jan. 1957. 11p. Order from LC. Mi $2.40, ph $3.30. WAPD-PWR-PMM-1034

Review of thermal design criteria for pressurized water reactors at 2000 psia. Westinghouse Electric Corp. Bettis Plant, Pittsburgh, Penna Feb. 1956. 18p. Order from LC. Mi $2.40, ph $3.30. WAPD-SFR-Rs-444

Fast fission effect in close packed lattices, by R. L. Hellens. Westinghouse Electric Corp. Atomic Power Div., Pittsburgh, Penna. (195?). Decl. Mar. 8, 1957. 6p. Order from LC. Mi $1.80, ph $1.80. WAPD-T-149

The rod-oscillator method for calibrating control rods, by F. J. Jankowski, D. Klein, and T. M. Miller. Westinghouse Electric Corp. Bettis Plant, Pittsburgh, Penna. Mar. 1956. 25p. Order from LC. Mi $2.70, ph $4.80. WAPD-T-323

Tabulation of neutron cross sections for U^{235} and U^{238} as used in the MUFT-III code, by R. L. Hellens. Westinghouse Electric Corp. Atomic Power Div., Pittsburgh, Penna. Mar. 1957. Decl. Oct. 14, 1957. 7p. Order from LC. Mi $1.80, ph $1.80. WAPD-TM-36

Diffusion approximation for hydrogen moderator in thermal region, by W. W. Clendenin. Westinghouse Electric Corp. Bettis Plant, Pittsburgh, Penna. Mar. 1957. Contract AT-11-1-GEN-14. 11p. Order from LC. Mi $2.40, ph $3.30. WAPD-TM-43

Candle--a one-dimensional few-group depletion code for the IBM-704, by O. J. Marlowe and P. A. Ombrellaro. Westinghouse Electric Corp. Bettis Plant, Pittsburgh, Penna. May 1957. Contract AT-11-1-GEN-14. 86p. Order from LC. Mi $4.80, ph $13.80. WAPD-TM-53

Effective fast group cross sections in four group theory, by Paride A. Ombrellaro. Westinghouse Electric Corp. Bettis Plant, Pittsburgh, Penna. May 1957. Contract AT-11-1-GEN-14. 30p. Order from LC. Mi $2.70, ph $4.80. WAPD-TM-63

Numerical studies of reactor kinetic equation parameters, by Marvin J. Abrams. Westinghouse Electric Corp. Aug. 1957. Contract AT-11-1-GEN-14. 50p. Order from LC. Mi $3.30, ph $7.80. WAPD-TM-82

Minutes of meeting of AEC Nuclear Cross Sections Advisory Group, Berkeley, California, May 24 and 25, 1955, by C. W. Zabel. Nuclear Cross Sections Advisory Group, AEC. Oct. 1955. Decl. Mar. 5, 1957. 50p. Order from LC . Mi $3.30, ph $7.80. WASH-188

Reports to the AEC Nuclear Cross Sections Advisory Group, Idaho Falls, Idaho. July 17-18, 1957, submitted by C. W. Zabel. Los Alamos Scientific Laboratory. Feb. 1958. 77p. Order from OTS. $2.25. WASH-194

Yankee Atomic Electric Company research and development program. Reference design--July 20, 1956. Westinghouse Electric Corp. Commercial Atomic Power, Pittsburgh, Penna. May 1957. Contract AT(30-3)-222. 23p. Order from LC. Mi $2.70, ph $4.80. YAEC-1

Progress Reports

Annual report Plutonium Recycle Program fiscal year 1957. Compiled by members of the staff of the Hanford Laboratories Operation. Hanford Atomic Products Operation, Richland, Wash. Sept. 1957. Contract W-31-109-Eng-52. 105p. Order from OTS. $2.75. HW-52000

Radiation Effects on Materials

Chemistry Division, Section C-11 summary report for July, August, and September 1948. Argonne National Lab., Lemont, Ill. May 1949. Decl. with deletions Feb. 18, 1957. Contract W-31-109-Eng-38. 81p. Order from LC. Mi $4.80, ph $13.80. ANL-4258 (Del.)

Irradiation effects on zirconium-clad uranium-zirconium fuel plates, by R. E. Balley. Argonne National Lab., Lemont, Ill. February 1958. Contract W-31-109-Eng-38. 11p. Order from OTS. 50 cents. ANL-5825

Effects of electron irradiation on the corrosion of Zircaloy-2 in a thermal loop, by B. O. Heston and M. D. Silverman. Oak Ridge National Lab., Tenn. Feb. 1956. Decl. Mar. 16, 1957. Contract W-7405-Eng-26. 9p. Order from LC. Mi $1.80, ph $1.80. CF-56-2-2

Behavior of S. I. R. fuels irradiated in sodium, (special request KAPL-79: The "Beta Experiment"). Final report on production test 105-180-P, by J. B. Lambert. Hanford Works, Richland, Wash. Aug. 1952. Decl. with deletions Apr. 1957. Contract W-31-109-Eng-52. 119p. Order from LC. Mi $6.00, ph $18.30. HW-25330(Del.)

Examination of several different rubber compounds after exposure to pile water, by W. S. Kelly. Hanford Atomic Products Operation, Richland, Wash. Sept. 1954. Decl. Mar. 28, 1957. Contract W-31-109-Eng-52. 7p. Order from LC. Mi $1.80, ph $1.80. HW-33164

Irradiation of organic reactor coolants in dynamic systems, by D. R. de Halas. Hanford Atomic Products Operation, Richland, Wash. Nov. 1957. Contract W-31-109-Eng-52. 41p. Order from OTS. $1.25. HW-53717

Activity from stainless steel in pile water, by R. B. Briggs, O. Sisman, and B. Manowitz. (Progress report for November 30, 1945). Clinton Labs., Oak Ridge, Tenn. Dec. 1945. Decl. Feb. 28, 1957. Contract W-7405-Eng-39. 13p. Order from LC. Mi $2.40, ph $3.30. MonN-36

Irradiation of thorium "W" slugs in A-40 at 30 megawatts, by G. H. Hanson. Phillips Petroleum Co. Atomic Energy Div., Idaho Falls, Idaho. May 1953. Decl. Mar. 29, 1957. Contract AT-(10-1)-205. 5p. Order from LC. Mi $1.80, ph $1.80. MTRL-119

Semi-annual program report to the AEC Research Division for the period ending December 31, 1956. Nuclear Metals, Inc., Cambridge, Mass. Feb. 1957. Contract AT(30-1)-1565. 12p. Order from LC. Mi $2.40, ph $3.30. NMI-1172

Gamma radiation levels from deposited fission products in the primary system, by R. F. Devine. Westinghouse Electric Corp. Bettis Plant, Pittsburgh, Penna. Jan. 1957. Contract AT-11-1-GEN-14. 5p. Order from LC. Mi $1.80, ph $1.80. WAPD-PWR-PS-2672

Growth of constrained alpha-rolled uranium under irradiation, by J. D. Eichenberg. Westinghouse Electric Corp., Atomic Power Div., Pittsburgh, Penna. Nov. 1954. Decl. Mar. 11, 1957. Contract AT-11-1-GEN-14. 23p. Order from LC. Mi $2.70, ph $4.80. WAPD-TN-506

Radioactive Waste

Field corrosion tests in Redox and Purex underground waste storage tanks, by Norman D. Groves, Morris C. Fraser, and William L. Walker. General Electric Co. Hanford Atomic Products Operation, Richland, Wash. June 1955. Changed from Official Use Only Mar. 22, 1957. Contract W-31-109-Eng-52. 10p. Order from LC. Mi $1.80, ph $1.80. HW-37642

Integrated pilot plant run, by D. E. Griffin, and others. Phillips Petroleum Co. Atomic Energy Div., Idaho Falls, Idaho. June 1955. Decl. with deletions Feb. 25, 1957. Contract AT(10-1)-205. 32p. Order from LC. Mi $2.40, ph $3.30. IDO-14376 (Del.)

Recovery of fission products from calcined first cycle solvent extraction wastes, by E. S. Grimmett. Phillips Petroleum Co. Atomic Energy Div., Idaho Falls, Idaho. June 1956. Contract AT(10-1)-205. 28p. Order from LC. Mi $2.70, ph $4.80. IDO-14408

Résumé of radioactive waste handling at the Knolls Atomic Power Laboratory, by D. A. Manieri and C. N. Perleberg. Knolls Atomic Power Lab., Schenectady, N. Y. May 1956. Contract W-31-109-Eng-52. 6p. Order from LC. Mi $1.80, ph $1.80. KAPL-M-DAM-1

Process design for the Livermore Waste Disposal Plant, (summary report), by J. L. Schewennesen, L. R. Michels, and M. L. Feldman. California Research and Development Co., Livermore, Calif. Sept. 1952. Decl. Apr. 1, 1957. 35p. Order from LC. Mi $3.00, ph $6.30. LWS-24632

Experience in equipment and building decontamination in the manufacture of Ba^{140}, by E. J. Witkowski. Clinton Labs., Oak Ridge, Tenn. Nov. 1946. Decl. Mar. 7, 1957. Contract W-35-058-Eng-71. 7p. Order from LC. Mi $1.80, ph $1.80. MonT-205

Evaluation of montmorillonite clay for use in decontamination of PWR radioactive waste liquors, by R. Ehrenreich. Westinghouse Electric Corp. Atomic Power Div., Pittsburgh, Penna. Feb. 1957. 11p. Order from LC. Mi $2.40, ph $3.30. WAPD-PWR-CP-2164

Reactors—General

Process specifications--reactor cooling water treatment. General Electric Co. Hanford Atomic Products Operation, Richland, Wash. Oct. 1954. Decl. Apr. 4, 1957. Contract W-31-109-Eng-52. 18p. Order from LC. Mi $2.40, ph $3.30. HW-32988

Successive generations disadvantage factors, by M. T. Lee. General Electric Co. Hanford Atomic Products Operation, Richland, Wash. Dec. 1956. Contract W-31-109-Eng-52. 8p. Order from LC. Mi $1.80, ph $1.80. HW-47707

Replacement actuator surge pot baffle test S2G, by D. J. Oakley and J. J. Stewart. Knolls Atomic Power Lab., Schenectady, N. Y. Apr. 1956. Contract W-31-109-Eng-52. 23p. Order from LC. Mi $2.70, ph $4.80. KAPL-M-EDL-113

Status report on S3G/S4G unit cell mechanical analysis, by E. B. Johansson. Knolls Atomic Power Lab., Schenectady, N. Y. Aug. 1956. Contract W-31-109-Eng-52. 18p. Order from LC. Mi $2.40, ph $3.30. KAPL-M-EJ-4

SAR primary coolant impurity activation and demineralizer shielding, by Frank D. Judge. Knolls Atomic Power Lab., Schenectady, N. Y. (1956). Contract W-31-109-Eng-52. 23p. Order from LC. Mi $2.70, ph $4.80. KAPL-M-FDJ-4

Variational and successive collision results for thermal utilization in slab lattices, by Henry Hurwitz, Jr. Knolls Atomic Power Lab., Schenectady, N. Y. Sept. 1956. Contract W-31-109-Eng-52. 10p. Order from LC. Mi $1.80, ph $1.80. KAPL-M-HH-7

Thermocouple in-pile calibration for S3G, by J. A. McCann. Knolls Atomic Power Lab., Schenectady, N. Y. Jan. 1956. Contract W-31-109-Eng-52. 9p. Order from LC. Mi $1.80, ph $1.80. KAPL-M-JAM-1

Results of the tests on several fast breeder flow orifices, by R. G. Kennison. Knolls Atomic Power Lab., Schenectady, N. Y. Oct. 1949. Decl. Mar. 28, 1957. Contract W-31-109-Eng-52. 15p. Order from LC. Mi $2.40, ph $3.30. KAPL-M-RGK-1

Report on trip to SPERT meeting at the National Reactor Testing Station, Idaho, by W. A. Northrop. Knolls Atomic Power Lab., Schenectady, N. Y. Sept. 1955. Decl. Mar. 2, 1957. Contract

W-31-109-Eng-52. 8p. Order from LC. Mi $1.80, ph $1.80. KAPL-M-WAN-7 (Del.)

Economic use of fuel shims in two-week cycles -- 3 x 9 configuration, by H. L. McMurry. Phillips Petroleum Co. Atomic Energy Div., Idaho Falls, Idaho. Oct. 1953. Decl. Mar. 7, 1957. Contract AT(10-1)-205. 16p. Order from LC. Mi $2.40, ph $3.30. MTR-L-218

Gamma ray scanning of spent fuel assemblies, by Thomas J. Parmley. Phillips Petroleum Co., Atomic Energy Div., Idaho Falls, Idaho. Oct. 1953. Decl. Mar. 7, 1957. Contract AT(10-1)-205. 14p. Order from LC. Mi $2.40, ph $3.30. MTR-L-231

Preliminary calculation of flux distribution in converter reactor cells, by E. R. Cohen. North American Aviation, Inc., Downey, Calif. Jan. 1952. Decl. Mar. 27, 1957. Contract AT-11-1-Gen-8. 5p. Order from LC. Mi $1.80, ph $1.80. NAA-SR-Memo-174

Preliminary report on the control of the converter reactor, by L. B. Robinson. North American Aviation, Inc., Downey, Calif. Jan. 1952. Decl. Mar. 27, 1957. Contract AT-11-1-GEN-8. 9p. Order from LC. Mi $1.80, ph $1.80. NAA -SR-Memo-178

Water flow required after shutdown for the converter reactor, by W. C. Cooley and H. Sletten. North American Aviation, Inc. Downey, Calif. Feb. 1952. Decl. Mar. 1, 1957. Contract AT-11-1-Gen-8. 13p. Order from LC. Mi $ 2.40, ph $3.30. NAA-SR-Memo-233

Mock-up for the converter reactor, by A. Benton. North American Aviation, Inc. Downey, Calif. Apr. 1952. Decl. Feb. 27, 1957. Contract AT-11-1-Gen-8. 8p. Order from LC. Mi $1.80, ph $1.80. NAA-SR-Memo-306

Additional flux calculations for converter reactor mock-up, by A. Benton. North American Aviation, Inc., Downey, Calif. June 1952. Decl. Mar. 28, 1957. Contract AT-11-1-Gen-8. 4p. Order from LC. Mi $1.80, ph $1.80. NAA-SR-Memo-332

Flattened vs uniformly loaded core, by Ralph Balent. North American Aviation, Inc., Downey, Calif. June 1952. Decl. Mar. 28, 1957. Contract AT-11-1-Gen-8. 14p. Order from LC. Mi $2.40, ph $3.30. NAA-SR-Memo-347

Preliminary study of systems utilizing low enrichment fuels, by S. Oestreicher and C. J. Brous. (Reactor research report). American Machine and Foundry Co. General Engineering Lab., Greenwich, Conn. Oct. 1954. Decl. with deletions Apr. 12, 1957. 25p. Order from LC. Mi $2.70, ph $4.80. AMF-GR-2-54 (Del.)

Soluble poisons in reactor control, by C. R. Breden, W. S. Brown, and M. Sivetz. Argonne National Lab., Lemont, Ill. Nov. 1955. Decl. with deletions Mar. 18, 1957. Contract W-31-109-Eng-38. 71p. Order from LC. Mi $3.90, ph $10.80. ANL-5244(Del. 2)

Power transfer functions of the EBWR obtained using a sinusoidal reactivity driving function, by J. A. DeShong, Jr. Argonne National Lab., Lemont, Ill. Jan. 1958. Contract W-31-109-Eng-38. 50p. Order from OTS. $1.50. ANL-5798

Temperature distributions in a reactor fuel plate. IV. Parallel plates with nonuniform heating, by J. K. Long and others. Battelle Memorial Inst., Columbus, Ohio. July 1954. Decl. Mar. 5, 1957. Contract W-7405-Eng-92. 14p. Order from LC. Mi $2.40, ph $3.30. BMI-916(Del.)

Critical concentration in the ISHR as a function of temperature, by M. Tobias and P. N. Haubenreich. Oak Ridge National Lab., Tenn. Feb. 9, 1953. Decl. Apr. 2, 1957. Contract W-7405-Eng-26. 8p. Order from LC. Mi $1.80, ph $1.80. CF-53-2-78

Progress report on power removal from homogeneous boiling reactors, by R. V. Bailey. Oak Ridge National Lab., Tenn. Nov. 1953. Decl. Apr. 8, 1957. Contract W-7405-Eng-26. 47p. Order from LC. Mi $3.30, ph $7.80. CF-53-11-65

HRT process flowsheets, by F. C. Zapp. Oak Ridge National Lab., Tenn. May 1955. Decl. Apr. 1, 1957. Contract W-7405-Eng-26. 31p. Order from LC. Mi $3.00, ph $6.30. CF-55-5-156

Deuterium explosion hazard in HRT underflow pot, by Herman O. Weeren. Oak Ridge National Lab., Tenn. Jan. 1956. Decl. Mar. 13, 1957. Contract W-7405-Eng-26. 18p. Order from LC. Mi $2.40, ph $3.30. CF-56-1-142

Minutes of HRP monthly information meeting, Apr. 26, 1956, by H. F. McDuffie. Oak Ridge National Lab., Tenn. May 1956. Decl. Mar. 13, 1957. Contract W-7405-Eng-26. 6p. Order from LC. Mi $ 1.80, ph $1.80. CF-56-5-126

Composition of solids from HRT mockup pressurizer, by D. M. Richardson. Oak Ridge National Lab., Tenn. June 1956. Decl. Mar. 14, 1957. Contract W-7405-Eng-26. 2p. Order from LC. Mi $1.80, ph $1.80. CF-56-6-56

Development of the lithium uranium carbonate system for use in homogeneous reactors, by H. F. McDuffie. Oak Ridge National Lab., Tenn. June 1956. Decl. Mar. 19, 1957. Contract W-7405-Eng-26. 5p. Order from LC. Mi $1.80, ph $1.80. CF-56-6-120

Fuel solution for the HRR, by Robert A. McNees. Oak Ridge National Lab., Tenn. June 1956. Decl. Mar. 14, 1957. Contract W-7405-Eng-26. 2p. Order from LC. Mi $1.80, ph $1.80. CF-56-6-168

Preliminary design of an iodine removal system for a 460-MW thorium breeder reactor, by D. E. Ferguson. Oak Ridge National Lab., Tenn. July 1956. Decl. Mar. 12, 1957. Contract W-7405-Eng-26. 23p. Order from LC. Mi $2.70, ph $4.80. CF-56-7-12

A preliminary economic evaluation of organic moderated, homogeneous power reactors, by Paul R. Kasten. Oak Ridge National Lab., Tenn. Nov. 1956. Decl. Mar. 12, 1957. Contract W-7405-Eng-26. 20p. Order from LC. Mi $2.40, ph $3.30. CF-56-11-52

Notes on the development of power reactors, by H. W. Crandall and W. K. Davis. California Research and Development Co., Livermore, Calif. Dec. 1952. Decl. with deletions Feb. 26, 1957. (LWS-24680(Del.2)). 28p. Order from LC. Mi $2.70, ph $4.80. CRD-R-21 (Del.2)

Power reactor studies - quarterly progress report May, June, and July 1957, by D. F. Babcock. E. I. du Pont de Nemours & Co. Savannah River Laboratory. Augusta, Ga. Sept. 1957. Contract AT(07-2)-1. 66p. Order from OTS. $1.75. DP-245

Preliminary feasibility report on the KAPL reactor, Knolls Atomic Power Lab., Schenectady, N. Y. Jan. 1949. Decl. May 13, 1957. Contract W-31-109-Eng-52. 109p. Order from LC. Mi $7.80, ph $25.80. KAPL-116

A UO_2-bismuth system as a reactor fuel, by D. H. Ahmann and others. General Electric Co. Knolls Atomic Power Laboratory. Schenectady N. Y. July 1957. Contract W-31-109-Eng-52. 14p. Order from OTS. 75 cents. KAPL-1877

Feasibility report of the 10-kilowatt thermal test reactor at the Knolls Atomic Power Laboratory, by R. G. Luce and L. Cherubin. Knolls Atomic Power Lab., Schenectady, N. Y. Nov. 1952. Changed from Official Use Only July 9, 1957. Contract W-31-109-Eng-52. 70p. Order from LC. Mi $3.90, ph $10.80. KAPL-ADM-833

Fuel assembly for oxide-fueled plutonium power breeder, by E. A. Luebke. Knolls Atomic Power Lab., Schenectady, N. Y. Dec. 1954. Decl. Mar. 29, 1957. Contract W-31-109-Eng-52. 9p. Order from LC. Mi $1.80, ph $1.80. KAPL-M-EAL-16

A molten-salt thorium converter for power production, by J. K. Davidson and W. L. Robb. Knolls Atomic Power Lab., Schenectady, N. Y. Oct. 1956. Decl. Feb. 26, 1957. Contract W-31-109-Eng-52. 27p. Order from LC. Mi $2.70, ph $4.80. KAPL-M-JKD-10

Neutron sources for reactors, by Jan P. Simpelaar. Knolls Atomic Power Lab., Schenectady, N. Y. Mar. 1956. Contract W-31-109-Eng-52. 11p Order from LC . Mi $1.80, ph $1.80. KAPL-M-JPS-3

Engineering Division termination report on the power-breeder reactor, by K. A. Kesselring. Knolls Atomic Power Lab., Schenectady, N. Y. May 1950. Decl. Feb. 23, 1957. Contract W-31-109-Eng-52. 309p. Order from LC. Mi $11.10, ph $51.50. KAPL-M-KAK-9

Design of fuel pins at elevated temperatures and fluxes, by L. F. Coffin, Jr. Knolls Atomic Power Lab., Schenectady, N. Y. Oct. 1951. Decl. Mar. 2, 1957. Contract W-31-109-Eng-52. 13p. Order from LC. Mi $2.40, ph $3.30. KAPL-M-LFC-2 (Del.)

Effects of channels on control and power distribution for a moving fuel reactor, by R. W. Deutsch. Knolls Atomic Power Lab., Schenectady, N. Y. Mar. 1955. Decl. Mar. 12, 1957. Contract W-31-109-Eng-52. 15p. Order from LC. Mi $2.40, ph $3.30. KAPL-M-RWD-1

Homogeneous reactor processing progress report for February 1953. Job 57. Vitro Corp. of America, New York. Mar. 1953. Decl. May 13, 1957. Contract AT(11-1)-217. 11p. Order from LC. Mi $1.80, ph $1.80. KLX-1610

Carrier design of irradiated APPR fuel elements, by F. D. Miraldi and A. D. Rossin. Massachusetts Inst. of Tech., Oak Ridge, Tenn. Engineering Practice School. Nov. 1954. Decl. Feb. 22, 1957. Contract W-7405-Eng-26, subcontract 70. 34p. Order from LC. Mi $3.00, ph $6.30. KT-178

Conceptual design of a once-thru-core, solid fuel FBR, by J. A. Quinville, T. P. Heckman, and R. E. Kelly. California Research and Development Co., Livermore, Calif. July 1953. Decl. with deletions Feb. 27, 1957. 33p. Order from LC. Mi $3.00, ph $6.30. LWS-22708 (Del.)

Preliminary PBR heat transfer study, by C. C. Old. California Research and Development Co., Livermore, Calif. Jan. 1953. Decl. Mar. 29, 1957. 11p. Order from LC. Mi $2.40, ph $3.30. LWS-24719

Plutonium alloys and compounds for solid fuel or control elements in fast reactors, by R. M. Fulrath and D. R. Mash. California Research and Development Co., Livermore, Calif. July 1953. Decl. with deletions Feb. 26, 1957. 6p. Order from LC. Mi $1.80, ph $1.80. LWS-24898 (Del.)

An investigation of fissionable material inventory requirements for a large-scale nuclear power industry, by D. B. Willmer. California Research and Development Co., Livermore Research Lab., Livermore, Calif. June 1953. Contract AT(11-1)-74. 27p. Order from LC. Mi $2.70, ph $4.80. MTA-43 (Del.)

The experimental development of a fuel handling system for the sodium reactor experiment, by W. J. Hallett and J. A. Leppard. Atomics International, a division of North American Aviation, Inc. Canoga Park, Calif. Jan. 1958. Contract AT(04-3)-49. 48p. Order from OTS. $1.50. NAA-SR-2004

Homogeneous reactor project quarterly progress report for period ending October 31, 1957. Oak Ridge National Lab., Oak Ridge, Tenn. n. d. Contract W-7405-Eng-26. 200p. Order from OTS. $5.50. ORNL-2432

The Bettis Technical Review - reactor and plant engineering. Westinghouse Electric Corp. Bettis Plant, Pittsburgh, Penna. Dec. 1957. Contract AT-11-1-GEN-14. 151p. Order from OTS. $2.75. WAPD-BT-5

Technical progress report - pressurized water reactor (PWR) project for period October 24, 1957 to December 23, 1957. Westinghouse Electric Corp. Bettis Plant. Pittsburgh, Penna. Contract AT-11-1-GEN-14. 87p. Order from OTS. $2.50. WAPD-MRP-71

Specification for helium leak testing of PWR core I blanket components--process specification AP-292542 (Rev. 3). Westinghouse Electric Corp. Bettis Plant, Pittsburgh, Penna. Feb. 1957. 5p. Order from LC. Mi $ 1.80, ph $1.80. WAPD-NCE-3509

Stable Isotope Separation

Determination of the boron isotope of mass ten by the neutron absorption counter method, by C. M. Judson. Standard Oil Co. of Indiana, Chicago, Ill. June 1946. Decl. Mar. 12, 1957. Contract W-7418-Eng-41. 54p. Order from LC. Mi $3.60, ph $9.30. A-2367

Separation of the boron isotopes by atmospheric distillation of dimethyl ether-boron trifluoride complex, by W. M. Keely and Kenton Atwood. Girdler Corp. Gas Processes Div. Process Development and Research Labs., Louisville, Ky. June 1953. Decl. Mar. 6, 1957. Contract AT(30-1)-1506. 25p. Order from LC. Mi $3.30, ph $7.80. M-5507

Determination of boron 10 by neutron absorption, by J. E. Hudgens, and others. New Brunswick Lab., AEC, N. J. Dec. 1954. Decl. Mar. 4, 1957. 21p. Order from LC. Mi $2.70, ph $4.80. NBL-102

Simple process separation factors for the separation of uranium isotopes by chemical exchange, by G. H. Clewett and W. B. Schaap. Carbide and Carbon Chemicals Corp. Y-12 Plant, Oak Ridge, Tenn. Oct. 1947. Decl. Mar. 6, 1957. Contract W-7405-Eng-26. 31p. Order from LC. Mi $3.00, ph $6.30. Y-41

Research and Development Division, Chemical Development Department progress report on special projects for the month of April, 1948. Carbide and Carbon Chemicals Corp. Y-12 Plant, Oak Ridge, Tenn. May 1948. Decl. Mar. 18, 1957. Contract W-7405-Eng-26. 27p. Order from LC. Mi $2.70, ph $4.80. Y-163

Y-12 Research Laboratory progress report - July 1, 1949 to September 30, 1949. Part III. Electromagnetic Research Division. Carbide and Carbon Chemicals Corp. Y-12 Plant, Oak Ridge, Tenn. Oct. 1949. Decl. Mar. 6, 1957. Contract W-7405-Eng-26. 66p. Order from LC. Mi $3.90, ph $10.80. Y-495

Electromagnetic separation of iron 58, by H. W. Savage and Boyd S. Weaver. Carbide and Carbon Chemicals Corp. Y-12 Plant, Oak Ridge, Tenn. Nov. 1949. Decl. Mar. 5, 1957. Contract W-7405-Eng-26. 54p. Order from LC. Mi $3.60, ph $9.30. Y-520

Technology—Feed Materials

Chambers Works process for the manufacture of peruranic acid, by G. M. Richardson. E. I. du Pont de Nemours & Co. Jackson Lab., Wilmington, Delaware. Nov. 1944. Decl. Mar. 18, 1957. 7p. Order from LC. Mi $1.80, ph $1.80. A-2576

Properties of uranyl fluoride, by G. R. Dean. Chicago. Univ. Metallurgical Lab. (Terminal report--problem assignment No. 182 MLC 2601). Sept. 1944. Decl. Feb. 16, 1957. Contract W-7401-Eng-37. 13p. Order from LC. Mi $2.40, ph $3.30. CC-2092

Removal of carbon from UF_4 pellets by oxidation, by L. M. Ferris. Oak Ridge National Lab., Tenn. Feb. 1956. Decl. with deletions Feb. 14, 1957. Contract W-7405-Eng-26. 22p. Order from LC. Mi $2.40, ph $3.30. CF-56-2-161 (Del.)

Development of a laboratory-size, fluidized-bed reactor, by B. M. Johnson. Hanford Atomic Products Operation, Richland, Wash. Nov. 1957. Contract W-31-109-Eng-52. 39p. Order from OTS. $1.25. HW-51834

Tentative Chambers Works process for the manufacture of C-112, (second revision), by C. W. Maynard, Jr. E. I . du Pont de Nemours & Co. Jackson Lab., Wilmington, Del. Aug. 1944. Decl. Mar. 6, 1957. 8p. Order from LC. Mi $1.80, ph $1.80. M-2934

Tentative Dye Works process for the manufacture of C-112 from N. G. solutions, by C. W. Maynard, Jr. Sept. 1943. Decl. Mar. 6, 1957. 5p. Order from LC. Mi $1.80, ph $1.80. M-3002

Tentative Dye Works process for the manufacture of C-106 (crude) from C-100, by C. W. Maynard, E. I. du Pont de Nemours & Co., Jackson Lab., Wilmington, Del. May 1943. Decl. Mar. 6, 1957. 6p. Order from LC. Mi $1.80, ph $1.80. M-3006

Tentative Dye Works process for the disposal of acid press cakes from press (3), C-100 series, by C. W. Maynard, Jr. E. I. du Pont de Nemours & Co., Jackson Lab., Wilmington, Del. July 1, 1943. Decl. Mar. 7, 1957. 6p. Order from LC. Mi $1.80, ph $1.80. M-3027

Analysis of special oxide. Harshaw Chemical Co., Cleveland, Ohio. Mar. 1946. Decl. Mar. 6, 1957. 2p. Order from LC. Mi $1.80, ph $1.80 M-3790

UF_4 production by continuous methods, by E. K. Teter. (Progress report of Pilot Plant - period of July 9, 1948 to August 14, 1948). Mallinckrodt Chemical Works, St. Louis. Aug. 1948. Decl. Mar. 28, 1957. 4p. Order from LC. Mi $1.80, ph $1.80. MCW-109

Effect of the uranium content of "in" ether upon the uranium content of raffinate, by W. G. Weber. Mallinckrodt Chemical Works, St. Louis. July 1948. Decl. Mar. 28, 1957. 4p. Order from LC. Mi $1.80, ph $1.80. MCW-127

Fluorination of uranium dioxide with hydrogen fluoride-water mixtures, by Carl W. Kuhlman, Jr. Mallinckrodt Chemical Works, St. Louis. Sept. 1948. Decl. Mar. 15, 1957. 21p. Order from LC. Mi $2.70, ph $4.80. MCW-138

Corrosion tests in $HF-H_2O$ atmosphere at high temperature--negative results, by C. F. Ritchie. Mallinckrodt Chemical Works, St. Louis. Jan. 1949. Decl. Mar. 2, 1957. 6p. Order from LC. Mi $1.80, ph $1.80. MCW-161

The preparation of uranous sulfate. Mallinckrodt Chemical Works, St. Louis. Jan. 1944. Decl. Mar. 30, 1957. 10p. Order from LC. Mi $1.80, ph $1.80. NYO-5046

The preparation of uranous sulfate. Report No. II. Mallinckrodt Chemical Works, St. Louis. Mar. 1944. Decl. Mar. 30, 1957. 7p. Order from LC. Mi $1.80, ph $1.80. NYO-5047

Extract from "42-39 (UF_4) wet process green salt (UF_4) brown oxide (UO_2) process." Report No. 2. Mallinckrodt Chemical Works, St. Louis. Mar. 1944. Decl. Apr. 1, 1957. Contract W-7405-Eng-29. 7p. Order from LC. Mi $1.80, ph $1.80. NYO-5049

An investigation of some factors affecting the assay of X (U) materials and of some short assay methods, by G. L. Martin. Mallinckrodt Chemical Works, St. Louis. Nov. 1944. Decl. Mar. 30, 1957. 10p. Order from LC. Mi $1.80, ph $1.80. NYO-5061

Changes in extractors to prevent emulsions, by Harold Yeager. Mallinckrodt Chemical Works, St. Louis. Mar. 1945. Decl. Mar. 8, 1957. Contract W-7405-Eng-1. 41p. Order from LC. Mi $3.30, ph $7.80. NYO-5094

Effects of impurities on the excess acid test (in uranium refinery feed liquors) by R. W. Bragdon. Mallinckrodt Chemical Works, St. Louis. Mar. 1945. Decl. Mar. 8, 1957. 6p. Order from LC. Mi $1.80, ph $1.80. NYO-5101

Loss on ignition test for purified uranium trioxide, by R. W. Bragdon, C. L. French, and G. L. Martin. Mallinckrodt Chemical Works, St. Louis. July 1946. Decl. Mar. 16, 1957. 13p. Order from LC. Mi $2.40, ph $3.30. NYO-5189

Technology—Raw Materials

Extraction of uranyl nitrate and thorium nitrate by organic solvents, physical and inorganic section, by O. Johnson and A. S. Newton. Ames Lab., Ames, Iowa. Nov. 1945. Decl. Feb. 16, 1957. Contract W-7405-Eng-82. 8p. Order from LC. Mi $1.80, ph $1.80. CC-2954

Raw Materials Program--Process Test Section, by H. M. McLeod, Jr. Oak Ridge National Lab., Tenn. Sept. 1956. Contract W-7405-Eng-26. 15p. Order from LC. Mi $2.40, ph $3.30. CF-56-9-84

Progress report - September 1950. Job 23. Kellex Corp., New York. Oct. 1950. Decl. Mar. 26, 1957. Contract AT(30-1)-848. 36p. Order from LC. Mi $3.00, ph $6.30. KLX-1207

Evaluation of solvent leaching process for pitchblendes. Kellex Corp., New York. Jan. 1951. Decl. Mar. 26, 1957. Contract AT(30-1)-848. 15p. Order from LC. Mi $2.40, ph $3.30. KLX-1210

Preliminary process design for waste residue recovery plant. Job 23. Kellex Corp., New York. June 1951. Decl. Apr. 3, 1957. Contract AT-(30-1)-848. 45p. Order from LC. Mi $3.60, ph $9.30. KLX-1218

A concluding report on the preparation of AAA ore solutions and on the investigation of the ether extraction of uranyl nitrate from the resulting solutions, by Steven H. Brown and others. Yale Univ., New Haven. May 1946. Decl. Mar. 8, 1957. 28p. Order from LC. Mi $2.70, ph $4.80. M-2765

Lyometallurgy survey, by F. W. Bloecher, Jr. Massachusetts Inst. of Tech., Watertown, Mass. Mineral Engineering Lab. Jan. 1951. Decl. with deletions Feb. 26, 1957. Contract AT-30-1-Gen-211. 33p. Order from LC. Mi $3.00, ph $6.30. MITG-247 (Del.)

Progress report on domestic ores for November 16, 1949 to December 15, 1949, by John Dasher. Massachusetts Inst. of Tech., Watertown, Mass. Mineral Engineering Lab. Dec. 1949. Decl. Feb. 26, 1957. Contract AT-30-1-Gen-211. 7p. Order from LC. Mi $1.80, ph $1.80. MITG-517

Development of a continuous ether extraction process for purification of uranium derived from AAA (pitchblende) ore, by J. V. Opie, W. H. Keller, and J. H. Yeager. Mallinckrodt Chemical Works, St. Louis. Jan. 1946. Decl. Mar. 8, 1957. Contract W-14-108-Eng-8. 108p. Order from LC. Mi $5.70, ph $16.80. NYO-5156

Removal of molybdenum in processing AAA (pitchblende) ore. VI. Washing methods, by A. S. Tomcufcik. Mallinckrodt Chemical Works, St. Louis. July 1946. Decl. Mar. 8, 1957. Contract W-14-108-Eng-8. 13p. Order from LC. Mi $2.40, ph $3.30. NYO-5190

Chemical Technology Division progress report on raw materials for July, 1957, by K. B. Brown and others. Oak Ridge National Lab., Oak Ridge, Tenn. n. d. Contract W-7405-Eng-26. 25p. Order from OTS. 75 cents. ORNL-2388

New Brunswick Laboratory report on the thorium program for the period ending February 15, 1952. New Brunswick Lab., AEC, N. J. Decl. Mar. 5, 1957. 15p. Order from LC. Mi $2.40, ph $3.30. TID-5192

Recovery of uranium from Lakeview leach liquor using trilaurylamine, by Oscar A. Nietzel, Charles F. Lubinger, and John C. Apidianakis. National Lead Co. Raw Materials Development Lab., Winchester, Mass. Sept 1957. Contract AT(49-6)-924. 15p. Order from LC. Mi $2.40, ph $3.30. WIN-30

Techniques for the evaluation of amines as uranium extractants and properties of some satisfactory amines, by Henry G. Petrow, and others. National Lead Co., Inc. Raw Materials Development Lab., Winchester, Mass. Aug. 1957. Contract AT(49-6)-924. 48p. Order from LC. Mi $3.30, ph $7.80. WIN-61

Laboratory investigation of Schwartzwalder Ralston Creek ore, by E. S. Porter and H. I. Viklund. National Lead Co., Inc. Raw Materials Development Lab., Winchester, Mass. Nov. 1957. Contract AT(49-6)-924. 30p. Order from LC. Mi $2.70, ph $4.80. WIN-71

Pilot plant studies of atmospheric and pressure leaching of uranium ores in alkaline solutions, by R. G. Beverly, W. A. Millsap, and G. Winslow. National Lead Co., Inc. Raw Materials Development Lab., Winchester, Mass. June 1957. Contract AT(49-6)-924. 39p. Order from LC. Mi $3.00, ph $6.30. WIN-73

Amenability testing of Lakeview ores, by D. R. George and R. U. Johnson. National Lead Co., Inc. Raw Materials Development Lab., Winchester, Mass. Aug. 1957. Contract AT(49-6)-924. 38p. Order from LC. Mi $3.00, ph $6.30. WIN-74

Pilot plant testing of solvent extraction of acid rip pregnant eluates, by W. D. Charles and others. National Lead Co. Raw Materials Development Lab., Winchester, Mass. June 1957. Contract AT(49-6)-924. 42p. Order from LC. Mi $3.30, ph $7.80. WIN-75

Pilot plant testing of Dakota lignites, by G. R. Pitmon and others. National Lead Co., Inc. Raw Materials Development Lab., Winchester, Mass. Oct. 1957. Contract AT(49-6)-924. 147p. Order from LC. Mi $7.20, ph $22.80. WIN-81

Oxidants in carbonate leaching of uraniferous ores, by P. J. Magno and M. A. DeSesa. National Lead Co. Raw Materials Development Lab., Winchester, Mass. Aug. 1957. Contract AT-(49-6)-924. 44p. Order from LC. Mi $3.30, ph $7.80. WIN-86